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Official publication of the American Society of Hospital Pharmacists

FORMERLY The BULLETIN

physician-pharmacist team plays key roles in DRUG EVALUATION

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Dear Sirs:

Interest in Law Articles

DEAR SIRS: I greatly enjoyed and appreciated the article, "The Legal Responsibility of the Hospital Pharmacist in the United States," which appeared in the March 1959 issue of the AMERICAN JOURNAL OF HOSPITAL PHARMACY. The article made reference to an article in the BULLETIN OF THE AMERICAN SOCIETY OF HOSPITAL PHARMACISTS, Vol. 14, May-June, 1957, "The Law Number." I would appreciate receiving a copy of this article if it is available. Thank you very much.

JOHN L. BUTLER, *Chief, Pharmaceutical Services*
Red Lake PHS Indian Hospital
Red Lake, Minnesota

DEAR SIRS: We received the tear sheet and the reprint of the articles by Dr. Archambault, and we want to express our appreciation for this material. It is very helpful for Registered Nurses, who are practicing, to have this kind of information.

J. MARION STEWART, R.N. *Director of Nursing*
City of Hope Medical Center
Duarte, California

Appreciates Personnel Service

DEAR SIRS: Please cancel my notice in the Positions Wanted Column. . . Thank you for the fine co-operation and space allotted to me.

SWAYNE H. LINDSAY

810 High Street
Bedford, Ohio

Formulary Service Commended

DEAR SIRS: Congratulations to the Formulary Committee! Our Pharmacy and Therapeutics Committee is more than pleased with the American Hospital Formulary Service. As one reads through it, he can appreciate the time and effort that has been put into this Formulary . . .

SISTER M. GORETTI, *Pharmacist*
St. Anthony's Hospital
St. Louis, Missouri

DEAR SIRS: Hospital pharmacists all over the country owe a debt of gratitude to those responsible for the American Hospital Formulary Service. . . I personally have had occasions to consult it when physicians called the pharmacy for information and I believe that every hospital in the country should have a copy.

If we are to have our Formulary the one of choice in hospitals, we must find ways to keep it up-to-date. I would therefore suggest that supplements be issued often so that information on the newer drugs will be available as released . . .

JOSEPH A. BARRY, *Chief Pharmacist*
The Memorial Hospital
Worcester, Massachusetts

DEAR SIRS: The Formulary is truly an outstanding piece of work. We had ordered only one for I knew I could not sell it to the administration nor to myself until I had seen a copy of the book. We now have placed an order for twenty books for St. Mary's Hospital.

SISTER MARY BERENICE, *Chief Pharmacist*
St. Mary's Hospital
St. Louis, Missouri

Education and the Doctor of Pharmacy Degree

DEAR SIRS: If and when an American School of Hospital Pharmacy is established, would there be any arrangements for the man who completed a three year course to earn a Doctor of Pharmacy degree?

FRANK J. STEELE, *Chief Pharmacist*
Greenwich Hospital Association
Greenwich, Connecticut

EDITOR'S NOTE: Not presuming to answer for the Dean of the proposed American School of Hospital Pharmacy, one may only indicate that it would be reasonable to assume that any candidate could receive the Doctor of Pharmacy Degree if he (1) met the requirements for admission to the school and (2) satisfactorily completed all the required courses. It would, however, undoubtedly require several years to do this and this may not be practical for the average person to accomplish.

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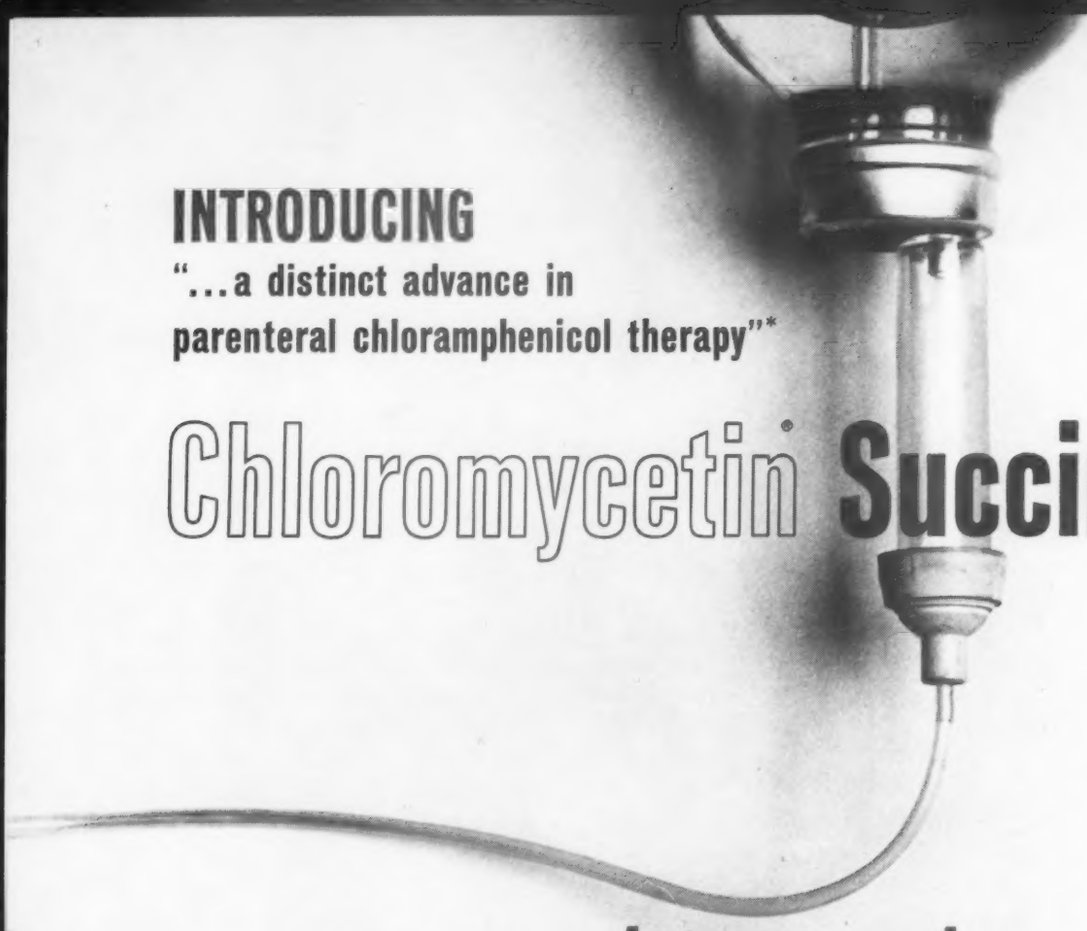

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*Ross, S.; Puig, J. R., & Zaremba, E. A., in Welch, H., & Marti-Ibañez, F.: Antibiotics Annual 1957-1958, New York, Medical Encyclopedia, Inc., 1958, p. 817.

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MEDICAMENTA VERA

66059

by DON E. FRANCKE

Reporting Adverse Drug Reactions in Hospitals

► A RELATIVELY NEW ACTIVITY OF Pharmacy and Therapeutics Committees, which assist in the formulation of broad professional policies relative to all aspects of drugs, is the study of adverse drug reactions in hospitals. This development was spearheaded during the presidential term of Dr. George Archambault when the Food and Drug Administration approached the ASHP to explore the feasibility of establishing some type of cooperative approach to obtain vital information on untoward effects of drugs. In 1955 a pilot study was undertaken by the Food and Drug Administration and the American Association of Medical Record Librarians, in collaboration with the ASHP, the American Medical Association and the Pharmacy and Therapeutics Committees of five hospitals. This project has since been expanded to include additional hospitals. Summaries of several reports on adverse drug reactions have been issued. One summary reported 235 adverse reactions to drugs occurring in eleven hospitals during a period of approximately thirteen months. These results show the need for more hospitals to establish a procedure for studying adverse reactions to drugs. While the method of handling this problem must necessarily vary from hospital to hospital, the procedure recommended by the Pharmacy and Therapeutics Committee of one hospital may be of interest. The following is quoted from the minutes of a recent meeting of such a Committee:

Adverse Drug Reactions. At the March 1958 meeting of the Committee it was moved, seconded, and carried that a simple form for use in reporting adverse drug reactions is desirable and, further, that the Secretary of the Pharmacy and Therapeutics Committee be requested to prepare such a form and submit it to the Committee for approval, and that the form as approved by the Pharmacy and Therapeutics Committee be submitted at a later date to the Senior Medical Advisory Staff for consideration.

The Secretary discussed briefly the pilot studies on adverse drug reactions being carried out by the Food and Drug Administration in several hospitals with the cooperation of various groups.

Voted To Recommend

It was moved, seconded, and carried that the following policy for reporting adverse reactions to drugs be recommended to the Senior Medical Advisory Staff for appproval:

That a method of reporting adverse drug reactions to Chiefs of Departments and Sections of the medical staff and to the Pharmacy and Therapeutics Committee be adopted in the interest of better patient care and teaching.

In the discussion of the motion, the following points were made.

1. *Need.* The increasing number of potent and potentially dangerous drugs makes it advisable, from a teaching as well as a patient care viewpoint, for the medical staff to be familiar with the overall incidence and extent of adverse reactions.

2. *Definition of Adverse Reaction.* The definition used by the Food and Drug Administration is as follows: 'An adverse drug reaction includes any pathological condition precipitated by a drug regardless of its nature or the circumstances of its occurrence, *i.e.*, toxicity caused by overdosage (therapeutic, accidental, suicidal, homicidal), hypersensitivity; allergy; or injury from improper technique of administration, use of the wrong drug, error in compounding, labeling, or packaging, or from other error in the manufacture of the drug, or in its preparation for use in the hospital. Reactions caused by blood and plasma products and other biologics need not be reported unless a chemical agent other than the basic substance is responsible. For example, if sodium citrate in whole blood were to cause a reaction, the case should be reported, with this offending agent designated.'

According to the above definition, a report would be made only when the patient (1) developed a pathological condition as a result of using the drug, (2) developed a hypersensitivity or allergy, or (3) suffered injury from the drug. It would exclude reporting instances in which the wrong medicine is administered or in which the drug was improperly labeled, *if no harm resulted to the patient.* These latter incidents would be reported to the hospital authorities by Nursing as at present.

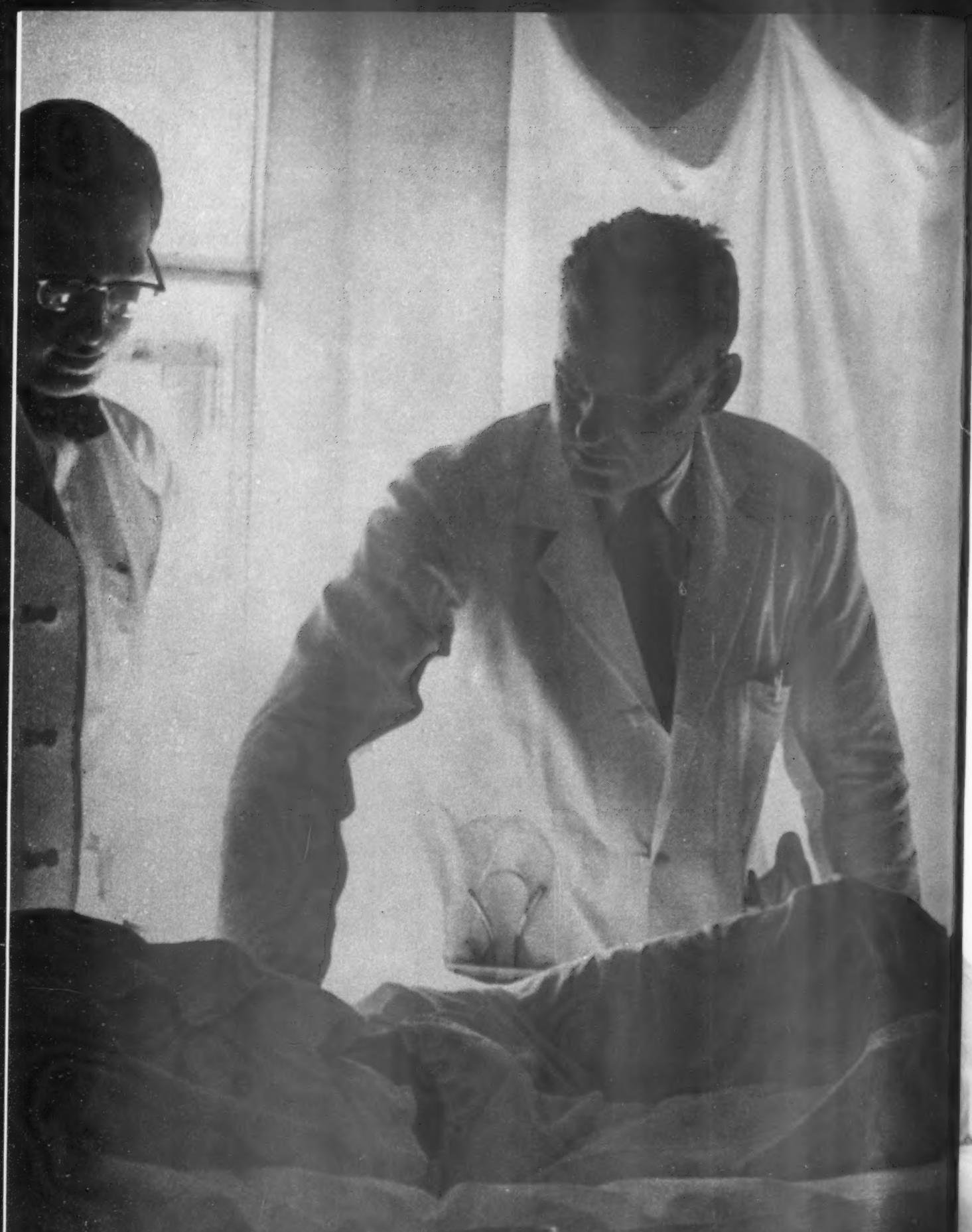
4. *Form to be used.* It was recommended that a modification of the form developed by the Food and Drug Administration be used for reporting adverse drug reactions in this hospital. The form would be modified (1) so that the patient's name could be stamped in the upper right hand corner and (2) a small duplicate 3 x 5 card would be attached on which only the patient's name would appear, together with the words "Report of Adverse Drug Reaction."

4. *Procedure.* When an adverse drug reaction occurs on the nursing unit, the nurse, or at her discretion, the ward clerk will stamp the patient's name (1) in the upper right hand corner of the FDA form and add the name of the physician and place it in the physician's reference booklet, and (2) on the attached card which is to be sent by the nurse to the Pharmacy for filing and to serve as a check when the completed report is received. If the physician and not the nurse observes the drug reaction he will obtain the form from the nurse or ward clerk.

The physician is to complete the FDA form and send it to the Secretary of the Pharmacy and Therapeutics Committee (Director of Pharmacy Service) who will transmit photocopies to the Chiefs of the appropriate Departments and Sections and to the Pharmacy and Therapeutics Committee.

The Pharmacy and Therapeutics Committee will study and analyze the report and present a summary of findings and recommendations to the medical staff, which may be used for teaching purposes and to improve patient care."

Hospital pharmacists are being continuously encouraged to expand their activities beyond the four walls of the Pharmacy. Establishment of a procedure for reporting adverse reactions to drugs represents another opportunity to promote better patient care through cooperative activity.



PHYSICIAN-PHARMACIST TEAM PLAYS KEY ROLES IN DRUG EVALUATION

by ABRAHAM GELPERIN

► THE HOSPITAL PHARMACIST IS A STAFF SPECIALIST. He administers a large dollar volume department of major importance to the hospital. Because of the tremendous expansion of therapeutics, both in numbers and diversity, drug therapy has become a serious problem to the physician as well. The flood of new medicaments and new combinations, many with esoteric labeling is almost like the atomic chain reaction. As in the decades past, a remarkable few will continue in usage as proven essential drugs. How then can there be evaluation of this flow of pharmaceutical offerings; for understanding must precede use.

An Effective Pharmacist

To be a drug therapy consultant to the staff physicians is not a new role. Those who fulfill this significant relationship have created a rapport with their physicians. An effective pharmacist is not just the filler of prescription and medical supply orders; but,

ABRAHAM GELPERIN, M.D., Dr. P.H., M.S.H.A., is Director of Health and Hospitals, Kansas City, Missouri.

Presented at Pharmacy Section of the Mid-West Hospital Association April 2, 1959, Kansas City, Missouri.

in addition, is a source of objective study, reasoning, and evaluation. The fulfillment of this basic function can truly be attained in the hospital, to advise as well as to administer.

Need for Critical Analyses

The question that now confronts both pharmacist and physician is whether the new proprietary does not, as well as does do what is claimed for it. Must it be tried because it has lower dosage, or lower cost, or greater tolerance or greater effect, or is new? Pharmaceuticals sponsored by particular drug manufacturers may have specific appeal. The "here are some samples to try" approach is often the entering wedge. New manufacturing techniques have produced new products; as have new packaging methods modified drug utilization procedures. Expensive advertisement sometimes pressures physicians into consideration of an offering. Of major import is the teaching of therapeutics by the contact men of pharmaceutical manufacturers. Certainly the critical analysis of new products alone is a tremendous task in itself, and the major area in which the hospital pharmacist can be of significant service.

Dosage

A consideration of each question raised above would assist in clarifying the factors that are basic to objective evaluation. The order of the discussion has no relation to the importance of the question. A smaller dose is frequently presented as an argument in favor of drug A over a competitor B; for example, 5 mg. instead of 500 mg. As we all know the amount of a drug in itself has no significance whatsoever as long as it can be administered with reasonable ease and convenience. However, an oral tablet or capsule that eliminates cleansing and retention enemas makes both nursing personnel as well as patients much happier.

Cost

The question of cost is always pertinent; but not the major determinant. Even in standard items such as acetylsalicylic acid, quoted prices are markedly variable. Are all of equal quality; or equal utilizability by people? Have some manufacturers solved the acid as well as cost problem of this heavily advertised and used drug by making tablets that do not disintegrate in the stomach, nor for that matter anywhere else? The opening gambit of "it costs less" will make one interested enough to listen. Effective final evaluation requires detailed basic information so that the question of cost is relegated to its proper position in the process of fact finding, last. A preparation that is as effective as its competition, as easy to administer and as safe will merit serious consideration, especially if it costs less.

Drug Tolerance

The problem of tolerance to any drug is one that is expected to be determined initially in laboratory animals and then proven in controlled clinical studies prior to even the consideration of its being offered to the professions for use. Obviously a wide margin of safety is the goal. However, this important safeguard must be weighed against specific and effective results at optimum dosage. A facet of this problem is the question of a cumulative effect which will modify evaluation as to both safety and efficacy. Any drug or mixture thereof that must be utilized on a weight per Kg. basis implies careful consideration of the individual variations that are extant in people as well as throughout the various ages of man. Obviously, the more serious a physical or mental disability, the less reluctance there will be to use the pharmaceutical with a limited or narrow margin of safety. A desperate prognosis forces the physician to use heroic measures. This postulates a place for dangerous drugs; but such must be so understood.

Newness Not Virtue

If a newly proposed drug or preparation is supposed to be more effective, there is an inherent assumption that this new preparation is just as safe and just as easy to administer. As long as the amount required can be tolerated, produces a greater and more prolonged diuresis, for example, or stabilized blood sugar level, or prolonged decrease in blood pressure, the preparation merits serious consideration. All of the factors just presented as well as details which have not been discussed have to be considered irrespective of the one salient feature that is being presented as the major selling point. It might be stated that any pharmaceutical preparation will be considered if it is just as good as a competitor's in all of the aspects requiring evaluation, and in addition, costs less to the patient for the necessary period of treatment. Therefore, a preparation, that is new, in itself, has no inherent virtue. We know from long experience that the great bulk of new drugs, even if effective, still somehow become passé, forgotten, and gather dust upon the pharmacists' shelves.

The reputation of a manufacturing pharmaceutical company will subconsciously sway one's attitude toward any preparation presented by such a firm for the consideration by both the pharmacist and the physician. The reputation for integrity and conservatism is precious. Yet, careful evaluation is not less important when new preparations are presented by such companies. Not infrequently a product is presented in a new form which may make it more effective. Penicillin with aluminum monostearate is a case in point. New packaging methods make pro-

ducts more attractive. To the profession, disposables eliminate cleaning and sterilizing, but cost more. A pretty bottle or handsome box does not have any chemotherapeutic effect upon the patient. Such packages are lovely to look at, but are not quite in the same category as breakfast cereals.

Double Blind Studies

A relatively new approach is being utilized and presented, namely, the critical clinical evaluation utilizing the so-called double blind technique. Important papers[1, 2, 3] on this problem have already been published and merit digestion. Actually, what is this supposedly new method of evaluation of a drug and why is it being utilized? It is acknowledged that unbiased evaluation requires the elimination of the human factor as much as possible. This entails both the physician as well as the patient not knowing what the latter is receiving. If there is careful selection and a sufficient number of patients with a disability that can be reasonably, accurately studied over a long enough period of time, the effect or lack thereof of any drug should be amenable to evaluation. Yet, we now know that even this technique cannot be, in itself, considered the ultimate. As has been previously stated, control too often is like the Emperor's invisible clothes, random is in reality haphazard, and that the blind portion of the double blind test ought to be called confused.

This technique is only one aspect of the testing of any drug. The pharmacological action as has been performed in laboratory animals for many decades sometimes does not have its proper important place. One should know more than just the fact that an individual is quiet, less agitated. Where is the effect and how, not only on the symptom complex for what the patient is being treated, but also upon the patient as a whole. The problem of side effects is one that has disturbed some students of this technique. This emphasizes the necessity for careful pharmacological evaluation. It has been stated that side effects for some drugs tested for a specific purpose have become useful in other areas because of the observed side effect.

Role of Placebos

The utilization of controls or placebos has also occasioned much discussion.[4] It is acknowledged that an all-or-none effect in the treatment of patients for a particular condition that is well-known as to its natural development during illness is both feasible and practical. Certainly the sulfa drugs in the treatment of such diseases as gonorrhea, meningococcus meningitis, pneumococcal pneumonia, etc. were dramatic upon initial usage. It is primarily with the non-parasitic afflictions, the degenerative, neoplastic, enzymatic, developmental, etc., diseases that controls become mandatory when any therapeutic regimen is being studied.

Assuming a statistically valid choice of the total population and the unbiased allocation of individuals into treated and untreated groups, what is this so-called "placebo medicament"? A placebo in Webster's Unabridged Dictionary has three possible definitions. It may be a medicine given merely to humor the patient, given for psychological effect. It may be something said or done to win favor, and lastly, it may be the Vesper Hymn sung for the dead. In Rogert's Thesaurus other words are noted which can be utilized as synonyms, such as flummery, buncombe, blarney and soft-soap. The connotation presented is that a placebo is not an innocuous pill or injection or treatment. It very definitely is a something. An example of many decades is the realization by physicians and pharmacists that a blue aspirin may be the effective drug, whereas any other color is vigorously rejected. A recent report emphasized the basic fact that no one now can deny the power of a placebo to influence pain, anxiety and other subjective states in certain people; also to occasionally affect objective symptoms, such as vomiting, or to actually produce "side effects."[4] In this study there was a marked increase in pep and appetite in patients with tuberculosis which persisted even after the placebo was stopped. An evaluation of the effectiveness of the placebo as compared to acetylsalicylic acid as a postpartum anodyne also showed that the "nothing" was about one-half as effective as the acetylsalicylic acid.

Patient-Physician Relationship

Probably the most important portion of evaluation is a fundamental, the patient-physician relationship. This interweaving of trust and hope has been characterized as falling into three basic models.[5] During the acute period of an illness or when there is a serious prognosis, the patient's role is that of a non-responding recipient, and the physician is like that of a parent to his infant. As the patient begins to recover, he can cooperate and there is a parent-child relationship. In the process of final recovery, rehabilitation, or in individuals with chronic illness; the patient's role is that of a user of expert help. The physician-patient relationship is then that of between two adults. Therefore, the attitude of both patient and physician not only initially, but also during the progress of any disease must change; otherwise abnormal relations, reactions and attitudes may ensue. The implication is that even in the most controlled of experiments, human relationships cannot be entirely eliminated.

A recent study from a psychiatric clinic utilizing psychotherapy for outpatients studied the effect of the placebo.[6] In four studies utilizing placebos, three

showed significant effects. It was concluded that the symptoms most amenable are the reaction or processing component of suffering. There was a greater tendency for psychic symptoms to show relief. In addition, there was a definite validity for considering the reaction to illness to also be illness. The anticipation of recurrence of emotionally painful experiences and the secondary sense of helplessness and failure engendered by repeated inadequate ineffective behavior make it reasonable to include anxiety and depression in the "processing component of suffering." This is very responsive to drug action in general, and presumably for the placebo. The basic effect nevertheless was the impact of clinic and the symbolic role of the physician. The importance of expectancies is apparent even in conditioned reflex experiments; therefore the placebo, oral treatment, has a fruitfulness from the standpoint of prior learning. The reaction to illness may prevent the healthy aspects of personality from functioning. Relief of this secondary reaction through even a placebo may free the effective aspects of the person's innate capabilities to cure himself.

To illustrate one facet of this problem a study being published is on the possible effect of meprobamate on severe cerebral palsy in children.[7] The drug and a placebo were utilized as adjuncts to physiotherapy. Two comparable groups were treated for a period of nine months; one with meprobamate for the entire period, and the other received the placebo. Only one of these children was considered to also be somewhat disturbed emotionally. All of the intelligence quotients were below 40. In this group, the results were approximately the same. One might have considered that a placebo was as good as an effective adjunct therapeutic. However, other reports in the literature using meprobamate in individuals with at least normal intelligence quotient measurements reported definite improvement, primarily in the area of reducing tension and anxiety.[7]

There is an innate bias in the most controlled of experiments because of the hopes of both physician and patient. Extremely few studies are available in which a drug or placebo has been studied in supposedly normal individuals. One such study reports the effects of iron tablets and placebos on healthy nurses.[8] Since all tablets were supposed to contain iron, the number of girls taking placebos, who had gastrointestinal reactions, was approximately the same as in the girls actually ingesting an iron preparation. Invariably, the drug evaluation is in groups of people who need help. A further difficulty is that a study unconsciously communicates the feeling that something ought to happen. We must never forget that many patients like to please their physicians by reporting a positive effect.

Statistical Validity

Lastly, the problem of interpretation of data is as we all know fraught with pitfalls. It has been evident for many years that a body of facts may not in itself result in a conclusion related to the data presented. Sometimes a seemingly valid summary is based on a study that basically is biostatistically invalid.[1,3] This practice, which is not rare, becomes especially dangerous when so many professional people will read the title of the paper and then quickly turn to the author's conclusions. It is a tremendous chore to consider reading all that is pertinent concerning any subject. However, it perhaps should be considered that we owe it at least to ourselves that what we believe, as a result of the work of others, is reasonably accurate and worthy of both retention and transmission to others.

Summary

The hospital pharmacist is an important co-professional in the field of patient care, who has a vital role to play in assisting patients' physicians to a better understanding of the drugs they prescribe. The profession of pharmacy is a key group. It is just as basic to you as it is to the prescribing physician to know the fundamentals of present day drug evaluation. How authors arrive at certain conclusions is fundamental, and is certainly more important than knowing their conclusions. This is necessary unless we assume that all those who investigate and publish have designed their study in a correct biostatistical framework. And, that they are fully aware of the pitfalls inherent in the double-blind technique, and placebo effect. That is too much to expect. Therefore, we must evaluate for ourselves, with an understanding and an ability to critically analyze, if we are to give maximum service to our patients. This is not too much to expect.

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OPPORTUNITIES FOR TRAINING IN HOSPITAL PHARMACY

by JOSEPH B. SPROWLS

► IN ANY DISCUSSION OF TRAINING for the hospital pharmacist an educator is faced with certain significant facts. Among these is the knowledge that approximately 30 percent of the total distribution of ethical pharmaceuticals takes place through hospital pharmacies. Thus, though small in number, hospital pharmacists handle a significant volume of the ethical pharmaceutical product. Secondly, one must recognize the significant increase in the number of hospitals and the growth of existent institutions. These offer the promise of employment to an increasing number of pharmacy graduates. Finally, one must recognize that the hospital pharmacist holds the position of closest proximity to the representatives of the medical profession.

The work of the hospital pharmacist seems to vary from that of the retail pharmacist in five major characteristics:

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Presented at the Seminar on Hospital Pharmacy conducted by the Western Pennsylvania Society of Hospital Pharmacists with the cooperation of Pfizer Laboratories, Harrisburg, 1958.

1. *The hospital pharmacist is a member of a large organization,* hence, everything operates on a large scale—purchases, records, management. Whereas in a retail pharmacy the pharmacist may be his own boss or subject to one supervisor with whom he deals at almost every level, the hospital pharmacist is a cog in a large machine, answering to a general management and having responsibility to several departments (such as accounting, medical department, surgery, stores, etc.).

2. *The hospital pharmacist works within a budget framework.* Whereas the retail pharmacist adjusts his purchases and his overhead (where possible) in accordance with sales, the hospital pharmacist must learn to operate within a budget which is usually adjusted quarterly. Inventory control and planned purchasing become much more important under such a system.

3. *The hospital pharmacist may be responsible for bulk compounding and prepackaging.* In the larger hospitals he may find it necessary to become familiar with manufacturing and prepackaging procedures on a scale which would never be encountered in retail pharmacy. This requires a knowledge of equipment and technics which would not be used at the retail level.

4. *The hospital pharmacist is much more of a consultant.* Because of his close proximity to staff physicians, the hospital pharmacist is continually asked to supply information regarding new products and, perhaps, even investigational drugs. He must be especially alert to new advances in pharmacology if he is to serve his position well. This special knowledge often leads to teaching responsibilities in the pharmacology department or the nursing education program.

5. *The hospital pharmacist has the possibility and responsibility of working with research programs in the hospital.* Such programs require a higher degree of application of technical information than do routine dispensing operations.

Difficult Translations

I can point out these facts about hospital pharmacy, yet, I cannot at this moment translate them with assurance into an academic program. As we all know, there are many approaches to the problem and all are more or less in the experimental stage. I find myself asking questions: What are the educational needs of hospital pharmacy? Is a non-academic internship the best approach? Is a graduate program leading to the M.S. degree more satisfactory? What courses should a faculty committee on curriculum prescribe for hospital pharmacy?

It is this intriguing area of the partially unknown which I should like to explore with you—not in the sense of reaching conclusions, but to the degree of presenting problems which must be solved. In doing so, I would like to congratulate hospital pharmacists in general, and the American Society of Hospital Pharmacists in particular, for the keen interest which they have manifested in pharmaceutical education and for the stimulus which they have given to the development of educational programs for hospital pharmacy.

Frequently, the accusation has been hurled at the colleges of pharmacy that the undergraduate program is designed for the exclusive purpose of training persons for the field of retail pharmacy. A simple reply to this accusation is the defensive statement that 85 percent or more of our graduates enter retail pharmacy. But, I am not satisfied to give such a reply, because I believe that the undergraduate program in pharmacy accomplishes a great deal more than that of training persons for retail pharmacy, and I would like to expand this point. Anyone who completes the typical program offered by a school of pharmacy today, receives a substantial background in both chemical and biological science, as well as a basic training in the subject of pharmacy. The curriculum offers far more than a vocational type of program and is, in fact, a basic course in science—just as the Bachelor of Science degree implies. The Bachelor of Science in Pharmacy differs from the Bachelor of Science in Chemistry only by the replacement of pharmacy courses for the humanities and the replacement of pharmaceutical chemistry for physical chemistry. In addition, the number of credit hours required for the degree in pharmacy (in most schools) is greater than the number of credit hours required for the degree in chemistry.

For the purpose of discussion, allow me to enumerate the courses which occur in the usual pharmacy curriculum.

Basic Courses

Chemistry	Biology
General	General
Organic	Microbiology
Analytical	Physiology
Pharmaceutical	

General Science
Mathematics
Physics

Specialized Courses

Pharmacy	Other
Principles and Processes	Pharmaceutical Economics
Operative (Physical)	Pharmacognosy
Dispensing	Pharmacology

Which of these courses is designed to train persons specifically for retail pharmacy—Dispensing Pharmacy? No. While the approach in the teaching of the course may be primarily that of the prescription pharmacy, the technics and information covered are fundamental to all phases of pharmacy work. Pharmaceutical Economics? No. Again, the approach may be primarily that of the retail store operation, yet, the principles of management and merchandising are applicable to any phase of pharmacy which involves distribution of pharmaceuticals. *In other words, the undergraduate*

curriculum in pharmacy provides a basic education in the sciences which are fundamental to pharmacy, and a sufficient comprehension of the literature and technics of pharmacy to provide general competency in the profession. No one pretends that it is possible within the scope of the undergraduate curriculum to educate persons as specialists in hospital pharmacy or any of the other specialties which have developed within the profession.

What Has Been Done and What Can Be Done in the Undergraduate Curriculum?

I have presented these facts in order to answer a question sometimes asked by hospital pharmacists: Why has hospital pharmacy been forgotten? Its absence from the undergraduate curriculum does not indicate oversight. Rather, it represents relegation of hospital pharmacy to its true position—a specialty to be developed following completion of the basic curriculum.

Some schools have found the time for an undergraduate elective in hospital pharmacy. Where offered, this becomes an orientation course which serves primarily to recruit students for the field. Manufacturing pharmacy holds a similar position when offered as an undergraduate course. No one would seriously contend that a single course provides sufficient training for either the specialties of hospital pharmacy or manufacturing pharmacy, but such courses do offer an opportunity for the student to become somewhat familiar with a career.

A few schools have made provision for all, or a part, of their undergraduate students to work in the pharmacy department of a general hospital. This time is sometimes substituted for laboratory time in dispensing pharmacy. Again, the exposure is insufficient to provide adequate training for one who intends to specialize in hospital pharmacy and the course becomes primarily a matter of orientation. Futhermore, when hospital experience is substituted for dispensing laboratory, care must be exercised that the student does not miss the usual training in technics, which constitutes an important feature of the dispensing course. Such hospital pharmacy experience has often been abused, since it has been used as a source of assistance in the hospital dispensary, rather than a real source of teaching and guidance in the important features of hospital pharmacy. Unless there is a low ratio of students to staff pharmacists, the hospital experience tends to become merely the acceptance of a routine to which one becomes rather quickly adapted. A proper course in hospital pharmacy would consider the purposes of the routine and the possibilities of other procedures which may exist in other institutions.

Effect of Five Year Program

Having heard that the basic curriculum will be expanded to five years, you are probably looking forward to some decided changes in the capabilities of future graduates. If you expect more extensive training in pharmacy, I must advise you that you are due for a shock. Most schools will probably make very little change in the professional content of their curricula, for this was not the motivating factor which brought about a lengthening of the program. The purposes quoted by most authors were to increase the quantity of cultural courses, or humanities, and to permit a better sequence of courses with respect to their prerequisites. In most schools the only courses to be added to the five year program are liberal arts courses.

I do not wish to minimize the importance of these courses, for they will help to make a better educated pharmacist; but they will not add to the amount of special training which he receives. A third purpose suggested for the addition of an extra year, is that of offering increased electives within the professional areas. Where this is done, it is almost certain that one of the electives will be hospital pharmacy.

In summary then, we can see that the five year course will offer no new approach to the teaching of hospital pharmacy, and the major instruction in this subject will remain at the post-graduate level.

Perhaps, many of you are wondering whether the five year course will bring about a reduction of interest in hospital pharmacy programs and graduate programs in general. None of us can speak with authority on a subject which has so many variables as this one, but there are some factors which we can discuss.

It is probable that the number of pharmacy graduates entering graduate schools will continue to increase. It has been observed that a high percentage of students with advanced standing (that is, those admitted with previous college records) continue their studies after graduation. In other words, increased undergraduate years did not deter them from graduate study. Furthermore, the selective forces which will operate throughout the five year program should produce a greater percentage of specially gifted students. Many of these will choose to continue their studies. It is my belief that students who are motivated toward graduate study are not greatly influenced by the time required to complete a program. They have set their minds upon a goal which they hope to achieve and the end will justify the means—so long as the means can be found.

Need To Upgrade Hospital Pharmacy

The question really is this: Will hospital pharmacy continue to attract a fair share of the available graduate students? Here the future does not seem too bright. Large numbers of young men cannot be expected to enter hospital pharmacy as a career when the number of worthwhile positions which exist in the field are numbered, perhaps, in the dozens. So long as hospital administrators fail to recognize the services which a well-trained hospital pharmacist can provide, and so long as they think of hospital pharmacy salaries on the same level as those of technicians, so long as law enforcement agencies permit a lower standard of pharmaceutical service to operate in some hospitals than that required at the retail pharmacy level, this condition will prevail. We must do everything we can individually and collectively to upgrade the position of the hospital pharmacist both salary-wise and position-wise; for, only in this way can hospital pharmacy be made sufficiently attractive to be elected by the most qualified students. For those now in hospital pharmacy a special challenge exists. They must make worthwhile contributions through their work so that their value will be recognized, and so that others will be motivated to follow in their footsteps.

I have purposely omitted women from this discussion. Because they are not usually breadwinners, professional and financial advancement may not be as important in their motivation. However, if an increasing number of women continue to enter the schools of pharmacy, we can expect an increasing number of them to be available for positions in hospital pharmacy. This is a factor of significance in any discussion of potential manpower.

Hospital Pharmacy Internships

The quality of internships must be continually improved in order to make them attractive. The motivation must be that of providing worthwhile training rather than that of obtaining inexpensive help in pharmacy. Graduates of schools of pharmacy have had excellent training. They are not willing to be exploited by supervisors who fail to motivate or direct their activities toward the achievement of desired goals. Hospital pharmacists should not undertake the supervision of internship programs unless they can feel comfortable that the factor of exploitation is not existent and that they are capable of providing proper motivation and guidance for the intern. The new standard for hospital pharmacy internships, which requires that these be offered only in hospitals approved by the American Medical Association for medical internships, is a step in this direction, because this assures the presence of a teaching atmosphere.

Future of Hospital Pharmacy Programs

In the future I believe that we will see an increase in the number of institutions offering graduate study in hospital pharmacy. Schools of pharmacy will increase their offerings because of an increasing awareness of the problem, because of an increased demand resulting from undergraduate elective programs, and because of an increasing expansion of graduate study generally. One of the encouraging factors with respect to graduate programs is the close integration which now exists in many universities between the schools of pharmacy and colleges of medicine. Where medical centers have developed, which house all of the schools of the health sciences within a single building or a group of buildings, the possibility exists for excellent cooperation between the pharmacy department of the teaching hospital and the faculty of the school of pharmacy. Through such integration many excellent programs have been and will be developed.

The number of non-academic internships offered by hospitals will continue to increase. Hospitals will be

forced to provide such internship programs in order to meet the need for specially-trained pharmacists which will be created by new hospitals and the increasing size of existing ones. These programs will also be in demand for those who desire to specialize in hospital pharmacy but who do not possess academic qualifications for graduate study.

I have touched here upon a major limitation of Master of Science programs which are in existence. Applicants for these courses must have achieved the academic standing which is required for graduate study. This is usually a B average, which limits the applicants to those in approximately the upper 20 percent of the graduating class. This level of academic ability is probably not an essential prerequisite for the work which is involved in hospital pharmacy, yet it is a customary requirement for the selection of candidates for the Master of Science degree. The academic requirement eliminates many potential hospital pharmacy candidates. On the other hand, the graduate program would seem to be highly desirable for those who aspire to positions of leadership and administration within the hospital pharmacy sphere.

Those who supervise graduate programs coordinated with internships are faced with some questions of which you may be unaware: To what extent are the approved internship requirements valid when served simultaneously with graduate study? Can we justify 640 clock hours of non-sterile and sterile manufacturing if academic instruction in these subjects is being given simultaneously? To what extent do the clock hour requirements of the internship program interfere with the study time which is necessary in an effective graduate program? Are the hours spent in internship as effective as the same amount of time spent in further instruction? Would a greater contribution be made to the education of the graduate student in hospital pharmacy if he carried out an extensive research program (perhaps in a hospital pharmacy subject) instead of meeting the clock hour requirements of the internship? In other words, as an educator I am forced to ask the question: How realistic are the internship requirements when carried out in conjunction with a graduate program?

Some of these questions could be asked of any internship program whether or not conducted in conjunction with a graduate degree program. How realistic are the hour requirements of the recommended internship? Does a graduate pharmacist really need 480 clock hours of dispensing pharmacy experience?—and 640 of manufacturing?—but only 480 of administration?

Lest you feel that I am attempting to destroy the standards of the internship program, let me hasten to say that I am not. My purpose is to point out the need for a careful study of this whole problem. We need to have a careful and comprehensive analysis of the total activities of the hospital pharmacist and an interpretation of these activities in terms of educational requirements. With this background, educators would be able to proceed with conviction in the establishment of hospital pharmacy curricula. I am hopeful that the survey now being conducted by the AMERICAN SOCIETY OF HOSPITAL PHARMACISTS either will present the information which is needed or will point the way to further studies.

There is one possibility for the future which I would like to discuss. This is the six year course in pharmacy. We may be closer to the adoption of this as the standard course in pharmacy than any of us realize. Certainly, it would solve many of the problems we now face. Let us consider hospital pharmacy, for example. In the six year program there would be abundant time for the development of specialized programs within the basic curriculum. Through proper choice of electives, it would be possible for the student to accomplish all of the course work which he now takes in the Master of Science program. But, there would be two important differences: (1) These electives would be open to all interested students and (2) the degree granted would be a professional degree, the Doctor of Pharmacy. Under this system, hospital pharmacy could be completely integrated into the teaching program of the Department of Pharmacy.

The six year program would not preclude the possibility of internships. There is a great deal which can only be taught through experience, and this situation will always prevail. With very little imagination, I can conceive of hospital pharmacy as a specialty beyond the Doctor of Pharmacy in a fashion similar to the specialties in dentistry or medicine.

Dynamic Forces

Thus, we conclude that the program of education in hospital pharmacy is a dynamic one, which is undergoing a rapid process of evolution. Being comparatively young as a specialty within the profession, it presents many challenging questions. I have recognized in this paper the need for a more comprehensive study of the educational needs and have suggested areas of doubt with respect to the present framework. The following probabilities are suggested for the future:

1. The five year course will permit an increasing number of schools to offer elective courses in hospital pharmacy at the undergraduate level.
2. There will be a continued increase in the number of non-academic hospital internships offered.
3. There will be a continued increase in the number of schools which offer graduate programs in hospital pharmacy.
4. The eventual acceptance of the six year course in pharmacy will permit the development of hospital pharmacy as one of the specialities within the basic pharmacy curriculum. This possibility is not seen with the five year course.

by LOUIS P. JEFFREY

SUPERVISION and on-the-job training FOR THE PHARMACY STAFF

► WITH THE PROFESSION of pharmacy growing rapidly and changing to keep up with the progress in the medical sciences, the training of employees becomes increasingly more important. I should like to discuss with you an outline of an on-the-job training program. This may be adopted or modified according to your specific needs but it could serve as the basis for a program.

General Orientation

1. Each staff member should be impressed with the fact that he is associated with a professional department and as such, should conduct himself accordingly. This applies to nonprofessional as well as professional personnel. Pharmacy, as a member of the health team, has earned its prestige position in the field of professional endeavor and it will require the efforts of all to keep it there.

2. A carefully planned tour of the department and also the hospital will offer proper orientation and initial familiarity to the new prospectus.

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3. There are several points which may appear to be minor in importance and are often omitted in an initial orientation. These include proper telephone response, the use of the want book, the checking of inventories, the arrangement of one's working area, lunch and rest periods, fire safety policies, and, I am sure, many others.

4. The inestimable importance of conducting proper liaison with nursing, medical and other services, with his fellow workers and with the patient who represents the public, should not be overlooked. Upon his conduct, especially in times of stress and emergency, rests the reputation of the profession, the department and the institution. This is vitally important.

Job Descriptions

A job description should outline the requirements of the particular work for which the person is responsible. The description should be written in detail so that, subsequent to orientation, this description may serve as a guide to that person as his work develops and progresses. With the aid of this job description analysis, his progress will be commensurate with his abilities and he will soon develop confidence. At convenient intervals, the chief pharmacist should

discuss with the staff member his assignment. In this manner the strong and weak points in his work may be pointed out to him. Both the professional and nonprofessional personnel must have a clear understanding of their respective duties and responsibilities.

Training

To be fully effective in training new staff members, the chief pharmacist must not only be competent in his knowledge of the function and operation of the pharmacy, but he must also be competent in his teaching skills. Therefore, I should like to enumerate several points which may be helpful.

1. Organize the job information into the proper learning order. Do not attempt to teach the new member the exact manner in which you perform this function, if order of learning is not critical, but rather, allow some area for self-reliance.

2. Stress those things which are important to the beginner. In your attempt to teach, you may omit things which are important to this new person because you know the job so well.

3. Do not assume that the new staff member knows more than he actually does.

4. Try to break down the work procedure into steps. This not only facilitates and speeds up learning but oftentimes it is easier for the new staff member to remember.

5. As hospital pharmacists, most of us are accustomed to practicing our profession in lieu of teaching it. Therefore, patience and perseverance should be developed on the part of the instructor or the chief pharmacist.

6. If you are going to train someone, go over your material first. Be sure that you have clearly outlined what you wish to say. Plan! Follow the example of the professional educator who reviews his lesson before he presents it to his class.

7. Lastly, remember that you are attempting to develop a permanent representative of your profession and the department. Therefore, try to develop his confidence, gain his good will and cooperation. These are intangible qualities which you as the leader must develop. This is known as "future interest with present planning."

I should like to list for you some "do's" and some "don'ts."

Do's	*Don'ts*
1. Put him at ease.	1. Criticize.
2. Create interest.	2. Overdo correcting.
3. Be patient	3. Correct in front of others.
4. Correct errors.	4. Be too quick to blame him.
5. Compliment.	
6. Encourage him.	

Organizational Lines

The use of an organizational chart is an important asset to an on-the-job training program. For it was once said "that when there is more than one there must be one who leads and one who follows." But the organization chart does more than just that—it promulgates lines of responsibility. Therein lies the key to the successful functioning of this chart.

The chart may serve other purposes. For instance, in our institution, members of the pharmacy staff are rotated regularly in various subdepartments. Assignments are posted and effected by means of this chart.

Continued Training

The responsibility of staff orientation and training does not end one or two months after the new employee has started his assignment. A training program, especially for the hospital pharmacy members of the staff, should be a continuous and regular part of the departmental function. It should be designed to keep the professional and nonprofessional staff abreast of current developments. This can be accomplished by utilizing one or more of the suggestions.

1. Meetings with the staff should be conducted on a regular basis—once a week or less depending upon individual circumstances.

a. Professional Staff—discussion of new products commercially available. Each member presents a product and "lectures" to the remainder of the group.

b. Total staff—a discussion of events of general staff interest, including departmental and hospital policies, plans and innovations.

2. Movies are a helpful and an interesting method of continued education. These may be shown once a month and the film may be supplemented by a discussion from the manufacturer's representative.

3. Pharmaceutical exhibits do not necessarily have to be directed especially to the medical staff. These displays also offer a great deal to the pharmacy staff.

4. Job description sheets are utilized effectively in the plan of professional personnel rotation. When a shift is made, these sheets are distributed and discussed individually with those members responsible, as typically represented in the organization chart.

Summary

The need for an on-the-job training program should be investigated if you are not currently engaged in one. The results of this program will benefit the employee, the department, the institution, and yourself.

HOSPITAL PHARMACY SURVEY

by FRED T. MAHAFFEY

► OVER THE PAST FEW YEARS, the National Association of Boards of Pharmacy has expressed itself as an Association by resolution both to its member Boards and the profession regarding the professional safeguards and pharmaceutical service that should be expected in hospitals. These resolutions state that all laws which are applicable to retail pharmacy should also be made to apply to hospital pharmacies and that the distribution and handling of drugs and medicines in institutional practice be properly regulated. The 1957 survey "State Supervision and Control Over Drug Distribution" by Leavitt C. Parsons, Editor of the *Apothecary,* presented at the annual meeting of the National Association of Boards of Pharmacy, (see *N.A.B.P. Proceedings,* 1957, pages 98-110) was extremely valuable in pointing out the existing confusion among the states regarding control over hospital pharmacies by state agencies. Many hospital pharmacists have expressed their concern over this problem and the need for cooperation by all the profession in this area.

On this and the following pages, the *N.A.B.P. Bulletin* presents the results of a survey taken by the N.A.B.P. office among all Boards in the continental United States in an attempt to shed more light on this subject and clarify the objectives as to jurisdictional authority. All State Boards (including the District of Columbia) are represented with the exception of Alabama and Illinois.

It is apparent from the table that more Boards of Pharmacy have jurisdiction over hospital pharmacies than is commonly supposed. Yet, there is an indication that some of the authority has and/or is now being shared by the Board of Pharmacy and some other agency in many states more so than in the past. Also evident is the fact that Boards of Health exercise more control over the standards in hospitals than in years past. While information relative to state hospital licensing laws was not determined in the survey, no doubt some of the increased number of Health Departments or Boards have acquired jurisdiction over hospital pharmacies through this type of legislation. A similar survey conducted by the National Association of Boards of Pharmacy in 1946 revealed (forty-eight states recorded) that the Board of Pharmacy in thirty-eight states had jurisdiction; Board of Health in four states; there was no vested authority over hospital pharmacies in four states; and in two states, the Board of Pharmacy's authority was questionable.

In this year's survey, with forty-seven of the forty-nine continental Boards of Pharmacy (P) reporting, thirty have jurisdiction over pharmacies or drug rooms in hospitals within their states.

In six states, the authoritative control is shared by the Board of Pharmacy and some branch of the Health Department of the State (PH). These are Florida, Iowa, Maryland, Oregon, Rhode Island and South Carolina. In Utah, the Department of Business Regulations under which the Board of Pharmacy functions has jurisdiction and licenses hospital pharmacies. Boards of Health (H) have jurisdictional authority in six states, Arkansas, Connecticut, Maine, Massachusetts, Nebraska and Washington. Four states, New Hampshire, New Mexico, Vermont and Wyoming, report that there is no vested authority (A) for the regulation of hospital pharmacies within their states. In New Mexico, legislation is being sought to strengthen the Board's authority as to professional safeguards in hospitals. The problem of authority over hospitals therefore lies in a very few states which indicates that it may be one of more adequate law enforcement.

The thirty Boards having jurisdiction, were granted this authority through the statutes of their state. Ten states maintain this authority by a combination of statutory provisions and rules and regulations.

From the N.A.B.P. Survey of Pharmacy Laws (see *N.A.B.P. Proceedings,* 1957, Drug Store Registration, 79), we note that seven states do not license retail pharmacies. This is confirmed by our present survey plus the fact that in only three states, retail pharmacies are not inspected annually. Recent legislation in Iowa now adds that state to the list of those who license pharmacy outlets, thus presently six states' laws do not contain provisions for licensing pharmacies. It can also be noted from the Survey of Pharmacy Laws that in eight states, Delaware, Iowa, Michigan, Montana,

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N.A.B.P. NATIONAL HOSPITAL PHARMACY AND NURSING HOME SURVEY

KEY: P—Board of Pharmacy; H—Board or Dept. of Health; PH—Shared Authority; A—No Vested Authority; N—No; Y—Yes.
***—Department of Business Regulation has jurisdiction.**

	Ala.	Ariz.	Ark.	Calif.	Colo.	Conn.	Del.	D. C.	Fla.	Ga.	Idaho	Ill.	Ind.	Iowa	Kans.	Ky.	La.	Maine	Md.	Mass.	Mich.	Minn.	Miss.	Mo.	Mont.	Nebr.	Nev.	N. H.	N. J.	N. M.	N. Y.	N. C.	N. D.	Ohio	Okla.	Oreg.	Pa.	R. I.	S. C.	S. D.	Tenn.	Texas	Utah *	Vt.	Va.	Wash.	W. Va.	Wis.	Wyo.
1. Who has jurisdiction?	—	P	H	P	P	H	P	P	P H	P	P	—	P	P H	P	P	P	H	P H	H	P	P	P	P	P	H	P	A	P	A	P	P 12	P	P	P	P H	P	P H	P H	P	P	D E P *	A	P	H	P	P	A
2. Permits or licenses issued to hospital pharmacies?	—	Y 7	N	Y 8	N 9	N	Y	N	Y	N	Y	—	N	N	Y	N	N	Y	Y	Y	Y	Y	Y	Y	Y	N	N	N	Y	N	Y	Y	Y	N	Y	N	Y	Y	N	Y	Y	Y	Y	N	Y	Y	Y	Y	N
3. Permits issued by Board of Pharmacy for retail pharmacies?	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	N	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y
4. Hospitals inspected regularly by agency having jurisdiction?	—	Y	Y	Y	Y	N	Y	N	Y	N	Y	—	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	N 10	N	Y	N	Y 11	Y	Y	Y	Y	Y	Y	4 Y 13	Y	Y	Y	Y	Y	N	Y	Y 15	Y	Y	N
5. Are hospitals required to have pharmacist in charge?	—	Y	Y 1	Y	Y	N	Y	Y	Y	Y	Y	—	Y	Y	Y	Y 2	Y	N	Y	Y	Y	Y	Y	Y	1 Y 2	Y	Y	N	Y 1	N	Y	Y	Y	Y	Y	6 Y 2	Y	Y	Y 1	N 14	Y	Y	Y	Y 16	Y	Y	Y 16	Y 1
6. Limitations as to size of hospital before pharmacist is required?	—	Y 3	N	Y 3	N	N	Y	N	N	Y	N	—	Y	Y	N	N	N	N	N	N	N 3	N	N	Y	N	N	N	N	N	N	N	Y	N	N	N	N	N	N	Y 3	N	Y	N	Y	N	Y	N	Y	N
7. Nursing homes, wherein drugs and medicines are dispensed, licensed and inspected by agency having jurisdiction?	—	N	N 5	Y	N	N	N	N	Y	N	Y	—	N	N 4	N 5	N	Y	Y	N	N 4	N 4	N	Y	N	N	N	Y	N	N	N	N	Y 12	Y	N	Y	N	N	Y 4	N 4	N	N	Y 1	N	N	N	Y	N 5	Y 16	N

Footnotes:

1. Require a pharmacy department supervised by a pharmacist for all hospitals that fill out-patient prescriptions.
2. Hospitals who do not employ a pharmacist are not permitted to compound medication.
3. Bed capacity size stipulated for the maintenance of a pharmacy and the employee of a pharmacist.
4. Nursing homes must obtain their medication through regular channels of distribution.
5. Nursing homes are under the jurisdiction of the State Health Department.
6. Exemption for dispensing medication by other than a pharmacist is provided in the law.
7. Any hospital registered with the State Board of Health must have a pharmacy license from the Board.
8. Limited hospital license for some general hospitals, maternity and tuberculosis hospitals having less than 100 beds. Compounding or dispensing to out-patients not permitted.
9. City, county, state or governmental hospital pharmacies are not required to be licensed. From Attorney General's opinion.
10. Legislation contemplated to strengthen inspection authority of the Board.
11. Board has authority to examine medication dispensed in hospitals. Registration with the Board of Pharmacy is necessary for accreditation of hospital when registered pharmacist must be employed.
12. Cooperative program between the Board, hospital association and state medical care commission underway.
13. Board inspects nursing homes for identification, storage and handling of such prescriptions and the disposal of unused drugs.
14. In smaller hospitals, physician is responsible for dispensing of drugs.
15. The Board of Pharmacy inspects all pharmacy outlets regardless of where found.
16. Hospitals, nursing homes or asylums not having the services of a pharmacist available shall use outlet licensed by the Board.
17. Board may determine the type of pharmaceutical supervision necessary.

Summary:

Who has jurisdiction?
- Board of Pharmacy.....30
- Board of Health.....6
- Shared Authority.....6
- No vested authority.....4
- Other agency.....1

Permits or licenses issued to hospital pharmacies?
Yes—29; No—18

Permits issued by Board of Pharmacy for retail pharmacies?
Yes—43; No—6

Hospitals inspected regularly by agency having jurisdiction?
Yes—38; No—9
Nursing stations inspected—18

Are hospitals required to have pharmacist in charge?
Yes—42; No—5

Limitations as to size of hospital before pharmacist is required?
Yes—13; No—34

Nursing homes, wherein drugs and medicines are dispensed, licensed and inspected by agency having jurisdiction?
Yes—14; No—33

North Carolina, Oregon, Wisconsin and Wyoming, the Board of Pharmacy is charged with the enforcement of the state narcotic act which would include supervision of narcotics in hospitals and nursing homes. Of the thirty Boards having complete jurisdiction, twenty-nine reply that they license hospital pharmacies.

Of the forty-seven states reporting, 42 require that hospitals engage the services of a pharmacist on a full or part-time basis. The survey discloses that there are some questions which arise as to the size of a hospital before the services of a pharmacist are required. Many states have solved this problem quite adequately by requiring that all hospitals (defined as such) shall have the services of a pharmacist on a full or part-time basis. The capacity or bed size determines when the services of a local or consultation pharmacist are required. It can be seen that there is a need for a clearer understanding of the definition of a hospital which will act as a guide for state authorities to follow. Thirteen states respond that there was no limitation as to the capacity of a hospital before the services of a pharmacist are required while thirty-two states respond that there were limitations as to capacity. Bed capacity size of hospitals is stipulated for the maintenance of a pharmacy and the employee of a pharmacist in four states, Tennessee, thirty beds; Michigan, California and Arizona, one hundred beds. With the exception of California, these requirements must be filled by a part-time, local or consultation pharmacist if the hospital has less than the stipulated bed capacity. The Arizona law also requires all hospitals licensed by the Board of Health to obtain a permit from the pharmacy Board. Drug rooms in hospitals and nursing homes are not required to be licensed in Minnesota. In Oregon, such drug rooms are licensed by the Board of Health. New regulations in Virginia give the Board of Pharmacy the prerogative of determining the type of supervision and if it is necessary.

Nursing Homes

Fourteen states reply that they license nursing homes wherein a pharmacy or drug room is maintained and legend drugs are dispensed. It was emphasized by some states that they require all medication for patients in nursing homes to be obtained through regular channels of distribution, e.g., on prescription of a physician and through an outlet licensed by the Board. Many states have made provisions for the storage and handling procedures of legend drugs in nursing homes for individual patients. Some have provided for disposition of unused medication following expiration of the patient. Prescriptions in such institutions are to be kept by the administrator or person in charge. In the States of Montana, Iowa, Michigan, Rhode Island, Massachusetts and Wisconsin, nursing homes are to obtain their medication through regular channels of distribution. The State Health Department in West Virginia, Arkansas and Kansas has jurisdiction over nursing homes.

As to the nature of inspections by the agencies having jurisdiction, thirty-eight states inspect the pharmacy or drug room facilities while eighteen extend these inspections to include floor nursing stations and general procedures involving the handling of narcotic and dangerous drugs in hospitals.

Four states require a pharmacy department supervised by a pharmacist for all hospitals that fill out-patient prescriptions. (Arkansas, New Jersey, Texas and Wyoming.) In Montana and Oregon, hospitals which do not have the services of a pharmacist are not permitted to compound for patients in hospitals.

One state, Oregon, reports that there are exemptions in the law for dispensing of medication in hospitals by persons other than a pharmacist or physician.

In California, the law stipulates that some general hospitals, maternity and tuberculosis institutions, having less than one hundred beds, shall be issued a limited hospital license which requires the record keeping of all medication administered. Out-patient dispensing and compounding of any kind is not permitted except by a pharmacist. An attorney general's opinion in Colorado has excluded city, county, state or governmental hospitals from obtaining a license from the Board. The authority to examine medication dispensed in hospitals is provided for in the laws of New York State and registration with the Board of Pharmacy is necessary for the accreditation of hospitals when a registered pharmacist must be employed.

In North Carolina, a cooperative program between the Board, the hospital association and state medical care commission is underway to strengthen provisions of the law. In Washington, while the jurisdiction rests with the Board of Health, the Board of Pharmacy inspects all pharmacies regardless of where they are found. Hospitals, nursing homes, asylums or similar institutions, which cannot obtain the services of a pharmacist, regardless of the circumstances, shall secure such pharmaceutical service from an outlet licensed by the Board in the State of Wisconsin.

It would appear that the national picture regarding authority to regulate pharmacy in hospitals and nursing homes is not as gloomy as has been proposed, yet there exist notable differences in the regulations governing hospital and retail pharmacy practice which cannot be reconciled by hospital administration or the jurisdictional agency in any state when the protection of public health is involved. The greatest problem—that of providing pharmaceutical service to the smaller institutions—is a challenge in which all pharmacy should be concerned and the entire problem is one in which both hospital and retail pharmacy share a mutual responsibility.

by
GEORGE J. GRUBER

the economies of BULK COMPOUNDING

► BULK COMPOUNDING AS PRACTICED IN HOSPITAL pharmacies is the compounding of a large quantity of a pharmaceutical preparation, usually with the aid of machinery, in anticipation of a continued demand by the medical staff for that particular preparation. This paper deals with an economic evaluation of the bulk compounding program in the Pharmacy of the United States Public Health Service Hospital, Seattle, Washington.

The primary reason for bulk compounding is economic. In simple words, the hospital saves the money that ordinarily makes up the profit of the manufacturer, the mark-up of the wholesaler, and the cost of transportation.

The bulk compounding policy of the United States Public Health Service Pharmacy Branch as set forth in the "Pharmacy Division of Hospitals Operation Manual" is as follows:

"The manufacture of pharmaceutical preparations should be undertaken when:

1. The item can be prepared at less cost than by purchase;

2. Is of better quality than obtainable on the market;

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TABLE I. BULK COMPOUND PREPARATIONS AND THEIR EQUIVALENTS IN COMMERCIAL PREPARATIONS WITH COMPARISONS OF COST.

ITEM	COST PER UNIT	COST PER YEAR	DIFFERENCE
Antipruritic Cream	$ 0.30/450 Gm.	$ 3.60/5,400 Gm.	
Commercial Equivalent	0.60/45 Gm.	72.00/5,400 Gm.	$ 68.40
Aluminum Acetate Solution	0.27/1000 ml.	9.60/36,000 ml.	
Commercial Equivalent	1.30/1000 ml.	46.80/36,000 ml.	37.20
Atropine Sulfate Ophth. Soln. 1%	0.03/10 ml.	3.00/1,000 ml.	
Commercial Equivalent	0.85/15 ml.	51.00/1,000 ml.	48.00
Ammoniated Mercury Ung. 5%		11.40/16,000 Gm.	
Commercial Equivalent	0.65/450 Gm.	22.88/16,000 ml.	11.48
Ammonium Chloride Syrup	2.00/4000 ml.	36.00/72,000 ml.	
Commercial Equivalent	6.95/4000 ml.	125.10/72,000 ml.	89.10
Aluminum Acetate Paste	0.50/450 Gm.	1.00/900 Gm.	
Commercial Equivalent	2.40/450 Gm.	4.80/900 Gm.	3.80
Benzalkonium Chloride Aqueous Soln. 1:1000	0.11/4000 ml.	68.55/2,440 liters	
Commerical Equivalent	2.22/4000 ml.	1354.20/2,440 liters	1285.65
Benzalkonium Instrument Soln. 1:1000		46.56/5,760 liters	
Commercial Equivalent	2.97/4000 ml.	4276.80/5,760 liters	4230.24
Benzalkonium Chloride Tincture	0.87/4000 ml.	73.20/336,000 ml.	
Commercial Equivalent	3.00/4000 ml.	252.00/336,000 ml.	178.80
Belladonna & Phenobarbital Elixir	2.71/4000 ml.	6.78/10,000 ml.	
Commercial Equivalent	16.20/4000 ml.	40.50/10,000 ml.	33.72
Calamine Lotion	1.00/4000 ml.	6.00/24,000 ml.	
Commercial Equivalent	1.22/4000 ml.	7.32/24,000 ml.	1.32
Calamine Lotion with Phenol 1%		0.90/3,600 ml.	
Commercial Equivalent		1.30/3,600 ml.	0.40
Calamine Liniment		18.00/18,000 ml.	
Commercial Equivalent		95.70/18,000 ml.	77.70
Camphorated Soap Liniment		1.00/2,800 ml.	
Commercial Equivalent		1.50/2,800 ml.	0.50
Castellani's Stain		9.31/4,000 ml.	
Commercial Equivalent	5.00/500 ml.	40.00/4,000 ml.	30.69
Chloramphenicol Otic 0.5%		4.65/500 ml.	
Commercial Equivalent	1.12/15 ml.	37.33/500 ml.	32.68
Chloramphenicol Ophth. 1%	0.05/5 ml.	34.00/3,400 ml.	
Commercial Equivalent	0.67/5 ml.	455.60/3,400 ml.	421.60
Chloral Hydrate Syrup 0.5 Gm./5 ml.	12.00/4000 ml.	108.00/36,000 ml.	
Commercial Equivalent		158.40/36,000 ml.	50.40
Cortisone Ophth. Suspension 1%	0.38/5 ml.	184.00/2,400 ml.	
Commercial Equivalent	1.80/5 ml.	864.00/2,400 ml.	680.00
Cocaine Hydrochloride Solution 10%		56.00/2,000 ml.	
Commercial Equivalent		132.00/2,000 ml.	76.00
Coal Tar Shampoo		52.50/60,000 ml.	
Commercial Equivalent	0.40/150 ml.	160.00/60,000 ml.	107.50
Codeine Phosphate Solution—30 mg./ml.	0.28/20 ml.	140.00/10,000 ml.	
Commercial Equivalent	1.02/20 ml.	510.00/10,000 ml.	370.00
Codeine Phosphate Syrup	5.44/4000 ml.	68.00/50,000 ml.	
Commercial Equivalent	13.60/4000 ml.	171.00/50,000 ml.	103.00
Cold Cream		4.60/10,000 Gm.	
Commercial Equivalent		12.00/10,000 Gm.	7.40
Coal Tar 5% in Lassar's Paste		2.80/2,685 Gm.	
Commercial Equivalent	2.28/450 Gm.	13.68/2,685 Gm.	10.88
Dental Prophylactic Paste		3.65/3,000 Gm.	
Commercial Equivalent		16.65/3,000 Gm.	13.00
Cod Liver Oil, Zinc Oxide Ointment		12.00/10,000 Gm.	
Commercial Equivalent	2.40/500 Gm.	48.00/10,000 Gm.	36.00
Diphenhydramine Elixir	5.00/4000 ml.	12.50/10,000 ml.	
Commercial Equivalent	8.19/4000 ml.	20.47/10,000 ml.	7.97
Dextrose Irrigating Sol. 4%	0.048/liter	48.00/1,000 liter	
Commercial Equivalent	1.82/liter of concentrate		
In terms of diluted solution		182.00/1,000 liter	134.00
Ephedrine Sulfate Syrup	5.00/4000 ml.	12.50/10,000 ml.	
Commercial Equivalent	9.18/4000 ml.	22.95/10,000 ml.	10.45
Electrolyte Mixture, Oral	0.23/250 Gm.	1.84/2,000 Gm.	
Commercial Equivalent	1.00/250 Gm.	8.00/2,000 Gm.	6.16
Fluoride, Sodium Sol. 2%		0.02/2,000 ml.	
Commercial Equivalent	0.80/60 ml.	26.40/2,000 ml.	26.38
Ferrous Sulfate Syrup		0.80/4,000 ml.	
Commercial Equivalent		3.16/4,000 ml.	2.36
Fluorescein, Sodium Sol. 2%		1.20/300 ml.	
Commercial Equivalent	1.00/15 ml.	20.00/300, ml.	18.80

Continued TABLE I. BULK COMPOUND PREPARATIONS AND THEIR EQUIVALENTS IN COMMERCIAL PREPARATIONS WITH COMPARISONS OF COST.

ITEM	COST PER UNIT	COST PER YEAR	DIFFERENCE
Gammexane Ointment 1%	1.25/500 Gm.	12.45/5,000 Gm.	
Commercial Equivalent	3.60/500 Gm.	36.00/5,000 Gm.	23.55
Green Soap Tincture	1.30/4000 ml.	20.80/64,000 ml.	
Commercial Equivalent	3.93/4000 ml.	62.88/64,000 ml.	42.08
Hydrocortisone Cream 1%	0.28/5 Gm.	276.00/5,000 Gm.	
Commercial Equivalent	0.78/5 Gm.	780.00/5,000 Gm.	504.00
Hydrogen Peroxide 3%		19.00/240,000 ml.	
Commercial Equivalent	0.15/500 ml.	72.00/240,000 ml.	53.00
Hydrogen Peroxide Glycerite 2.5%		0.96/200 ml.	
Commercial Equivalent	1.40/120 ml.	2.20/200 ml.	1.24
Hydrochloric Acid, Diluted		0.20/1,000 ml.	
Commercial Equivalent		1.44/1,000 ml.	1.24
Homatropine Hydrobromide Solution 4%		6.40/200 ml.	
Commercial Equivalent		26.88/200 ml.	20.48
Hydrophylic Petrolatum Cream		12.50/25,000 Gm.	
Commercial Equivalent	0.73/450 Gm.	40.50/25,000 Gm.	28.00
Hyoscyamus, Potassium Citrate Mixture		68.00/100,000 ml.	
Commercial Equivalent		436.70/100,000 ml.	368.70
Iodochlorhydroxyquin Cream 3%		24.60/13,000 Gm.	
Commercial Equivalent		150.80/13,000 Gm.	116.20
Milk of Magnesia		40.64/320,000 ml.	
Commercial Equivalent		58.40/320,000 ml.	17.76
Meperidine Hydrochloride 50 mg./ml.	0.59/20 ml.	531.00/18,000 ml.	
Commercial Equivalent	1.33/30 ml.	798.00/18,000 ml.	267.00
Methylcellulose Solution 2%		25.20/144,000 ml.	
Commercial Equivalent		140.08/144,000 ml.	114.88
Morphine Sulfate 10 mg./ml.	0.18/20 ml.	90.00/10,000 ml.	
Commercial Equivalent	0.37/20 ml.	186.48/10,000 ml.	96.48
Methiodal Solution 20%	1.09/50 ml.	175.50/8,000 ml.	
Commercial Equivalent	1.71/50 ml.	273.60/8,000 ml.	98.10
Neomycin Sodium Propionate Otic	0.15/15 ml.	5.00/500 ml.	
Commercial Equivalent	1.00/15 ml.	33.30/500 ml.	28.30
Neomycin Cream 5 mg./Gm.	0.19/15 Gm.	190.00/15,000 Gm.	
Commercial Equivalent	0.66/15 Gm.	660.00/15,000 Gm.	470.00
Naphtha Distillate Ointment 5%		6.91/2,270 Gm.	
Commerical Equivalent	5.10/450 Gm.	25.50/2,270 Gm.	18.59
Para-aminosalicylate Sodium Solution		945.00/350,000 ml.	
Commercial Equivalent		1022.00/140,000 ml.	77.00
Phenylephrine Hydrochloride Sol. 0.25%	0.11/15 ml.	293.37/40,000 ml.	
Commercial Equivalent	0.17/15 ml.	453.39/40,000 ml.	160.02
Potassium Chloride m.Eq.		49.00/14,000 ml.	
Commercial Equivalent		177.66/14,000 ml.	128.66
Procaine Hydrochloride Solution 1%	0.08/50 ml.	96.00/60,000 ml.	
Commercial Equivalent	0.34/30 ml.	680.00/60,000 ml.	584.00
Procaine Hydrochloride Solution 2%	0.09/50 ml.	54.00/30,000 ml.	
Commercial Equivalent	0.34/30 ml.	340.00/30,000 ml.	286.00
Phenobarbital Elixir		14.50/20,000 ml.	
Commercial Equivalent	4.50/4000 ml.	22.50/20,000 ml.	8.00
Pilocarpine Nitrate Solution 4%		5.85/600 ml.	
Commercial Equivalent		21.60/600 ml.	15.75
Pilocarpine Nitrate Solution 2%		9.09/1,100 ml.	
Commercial Equivalent	0.51/15 ml.	37.23/1,100 ml.	28.14
Physostigmine Salicylate Sol. 0.25%		1.10/100 ml.	
Commercial Equivalent		26.00/100 ml.	24.90
Physostigmine Salicylate Sol. 1%		5.64/200 ml.	
Commercial Equivalent		21.70/200 ml.	16.06
Potassium Iodide, Saturated Solution		46.26/8,000 ml.	
Commercial Equivalent		103.75/8,000 ml.	57.49
Rubbing Alcohol		24.00/200,000 ml.	
Commercial Equivalent	0.19/500 ml.	76.00/200,000 ml.	52.00
Surgical Soap Solution	1.03/gal.	463.50/450 gal.	
Commercial Equivalent	1.48/gal.	666.00/450 gal.	202.50
Sulfisoxazole Syrup 0.5 Gm./5 ml.		70.40/20,000 ml.	
Commercial Equivalent	3.15/500 ml.	126.00/20,000 ml.	55.60
Sodium Chloride Isotonic Soln. for Irrigation		28.00/32,000 liters	
Commercial Equivalent	0.46/1000 ml.	14720.00/32,000 liters	14,692.00
Salicylic Acid 5% in Isopropanol 70%		8.58/24,000 ml.	
Commercial Equivalent	9.90/4000 ml.	59.40/24,000 ml.	50.82
Scopolamine HBr Ophth. Soln. 0.25%		0.70/100 ml.	
Commercial Equivalent		26.00/100 ml.	25.30

Continued TABLE I. BULK COMPOUND PREPARATIONS AND THEIR EQUIVALENTS IN COMMERCIAL PREPARATIONS WITH COMPARISONS OF COST.

ITEM	COST PER UNIT	COST PER YEAR	DIFFERENCE
Scopolamine Hydrobromide 0.5%		1.60/400 ml.	
Commercial Equivalent		10.60/400 ml.	9.00
Sodium Phosphate Enema Solution		23.20/80,000 ml.	
Commercial Equivalent	0.45/140 ml.	256.95/80,000 ml.	233.75
Sodium Sulfate Saturated Solution	0.35/500 ml.	0.35/500 ml.	
Commercial Equivalent	0.95/500 ml.	0.95/500 ml.	0.60
Sodium Fluoride Paste	0.04/60 Gm.	0.16/240 Gm.	
Commercial Equivalent	0.88/60 Gm.	3.52/240 Gm.	3.36
Sodium Chloride, Isotonic I.V.		28.00/20,000 ml.	
Commercial Equivalent	0.14/20 ml.	140.00/20,000 ml.	112.00
Scalp Lotion for Blond Oily Hair		0.90/4,000 ml.	
Commercial Equivalent	0.70/270 ml.	10.50/4,000 ml.	9.60
Scalp Lotion for Blond Dry Hair		0.90/4,000 ml.	
Commercial Equivalent	0.70/270 ml.	10.50/4,000 ml.	9.60
Scalp Lotion for Brunette Oily Hair		1.05/16,000 ml.	
Commercial Equivalent	0.90/250 ml.	57.60/16,000 ml.	56.55
Scalp Lotion for Brunette Dry Hair		1.05/4,000 ml.	
Commercial Equivalent		14.40/4,000 ml.	13.35
Tar, Compound Ointment		10.66/8,000 Gm.	
Commercial Equivalent	0.98/450 Gm.	17.77/8,000 Gm.	7.11
Tetracaine HC1 Solution 2%		0.43/120 ml.	
Commercial Equivalent		2.66/120 ml.	2.23
Tetracaine Hydrochloride Solution 1%		0.86/480 ml.	
Commercial Equivalent		5.32/480 ml.	4.46
Tetracaine Hydrochloride Solution 0.5%		0.72/800 ml.	
Commercial Equivalent	1.34/60 ml.	17.42/800 ml.	16.70
Thiamine Hydrochloride Elixir		44.96/100,000 ml.	
Commerical Equivalent	3.67/4000 ml.	91.75/100,000 ml.	46.79
Tar Colloidal Ointment 5%		6.00/4,500 Gm.	
Commerical Equivalent	3.00/200 Gm.	66.00/4,500 Gm.	60.00
Vitamin A & D Ointment		5.75/9,000 Gm.	
Commerical Equivalent	1.80/450 Gm.	36.00/9,000 Gm.	30.25
White Lotion		2.58/12,000 ml.	
Commerical Equivalent	1.15/30 ml.	460.00/12,000 ml.	457.42
Water for Injection	0.10/50 ml.	40.00/20,000 ml.	
Commerical Equivalent	0.15/30 ml.	100.05/20,000 ml.	60.05
Wintergreen Ointment (Methyl salicylate)		1.80/2,050 Gm.	
Commerical Equivalent	2.25/450 Gm.	10.12/2,050 Gm.	8.32
Zinc Boric Ophthalmic Solution		0.00/1,500 ml.	
Commerical Equivalent	0.60/15 ml.	60.00/1,500 ml.	54.00
Zinc Gelatin Paste (Unna's Boot)		11.30/10,000 Gm.	
Commercial Equivalent	1.50/450 Gm.	33.30/10,000 Gm.	22.00
		TOTAL SAVINGS	$ 28,172.56

3. Is unobtainable on the market; or is for
4. Emergency need."

Pharmaceutical bulk compounding in the United States may be extensive as evidenced in the larger hospitals such as the Massachusetts General Hospital[2] and the University of Michigan Hospital. At these hospitals, bulk compounding not only includes the production of large volume parenteral solutions, the preparation of allergy desensitizing extracts and compressed tablet manufacturing, but also includes the precipitation and sale of silver salts obtained from x-ray developer fluid used in the hospital. The University of Michigan Hospital Pharmacy, from March 1936 to Oct. 1937, collected 1,998 ounces of metallic silver valued at $852.00.[5]

In smaller hospitals, bulk compounding consists of only a few simple solutions prepared in the restricted space limitations of their pharmacies.

It is interesting to note that Switzerland hospital pharmacists not only do a great deal of bulk compounding, but do extensive analytical analysis work on all drugs and chemicals purchased on the open market. They are also called on to inspect and license all retail pharmacies in Switzerland and to control the narcotic drug trade throughout the country.[4]

Computing Cost

The standards of the research done on the cost of bulk compounding here in the Seattle U.S.P.H.S. Hospital Pharmacy are as follows:

1. All items for which bulk compounding control records are kept in the Pharmacy were evaluated.
2. Compounded items which are prepared only on demand (such as various dilutions of actetic acid or silver nitrate and nonstandard strengths of regularly stocked ointments) were not evaluated.

View of a hospital pharmacy laboratory

3. The total amount prepared of each particular item was calculated from the record kept on each batch on the *Pharmaceutical Control Record PHS 1687.*

4. In obtaining the difference of cost of the bulk compounded item to a similar product on the commercial market, thorough investigation was made so that the lowest priced commercial equivalent of the product was selected. If the product was available on government General Services Administration contract, the lowest price listed under any contract, including that listed in the U.S.P.H.S. Medical Supply Station Catalogue, Perry Point, Md., was selected as the comparison price.

5. Where the commercial price of a product varied as to the quantity of the item ordered, the lowest price available—by the purchase of the lowest quantity necessary to secure that price—was used.

The total number of bulk compounded items covered in this survey were 97 different preparations. These represent all the regularly manufactured items produced by our Pharmacy for which an actual comparison to a commercially equivalent product can be made. It does not include items compounded sporadically for a period of one or two months to satisfy a specific need and then discontinued.

The cost of the bulk compounded preparations was determined entirely on the basis of the cost of the ingredients. The cost of the labor was disregarded, partially because bulk compounding is only a fractional function of the pharmacy staff, and partially because the total cost differential is directly compared with the total labor cost later in this paper.

The cost of manufacturing equipment was not computed because it was difficult to assay a real proportional expense per fiscal year. For example, most of our large machinery has been amortized years ago, some of our equipment has been secured through surplus equipment at negligible cost to us, and some has been procured through the contractual terms involved in the building of our new outpatient building. Several items have been salvaged from the graveyard of condemned equipment. At any rate, on the basis of full depreciation of all the equipment at full value over a period of ten years, the cost of equipment would be a negligible 200 to 300 dollars per year.

Salaries vs. Savings

A survey of items manufactured that we were unable to include in our comparison costs is as follows:

Dental Antibiotic Fungicide Paste, Thermometer Iodine Solution, Ether-Alcohol Solution, Compound Pepsin Elixir, Mild Silver Protein Solution, Boric Acid Solutions, Streptokinase-Streptodornase Jelly, Suby's G Solution, Mercury Bichloride Otic Solution, Salicylic Acid Otic Solution, etc.

Subtracting the cost of all bulk compounded items for fiscal year 1955 from the lowest cost obtainable of equivalent commercially available items, our Pharmacy was able to realize a savings of $28,172.56 by bulk compounding. The total number of manufactured items (batches of bulk compounded items) for fiscal year 1955 was 1442. The total value of all drugs issued by our Pharmacy in that year was $52,589.40. The total number of prescriptions filled in our Pharmacy was 36,652.

We asked the Finance Department to give us the total amount of salaries paid to the entire pharmacy staff (including the intern and pharmacy storekeeper) for the fiscal year 1955. The total cash expended on the pharmacy payroll for 1955 was $27,419.35. The total cash saving realized by our pharmacy bulk compounding during fiscal year 1955 was $28,172.56.

The professional education and training of pharmacists prepares them to carry out bulk compounding. It is one of their basic professional responsibilities and prerogatives. As shown by Table I., the bulk compounding of several rather simple preparations can result in significant savings which may tend, directly or indirectly, to make hospital pharmacy a more attractive career professionally and economically.

References

1. *Division of Hospitals Operations Manual, Pharmacy,* U. S. Public Health Service, Part D, Chapter 6, Section 3.1.
2. Murphy, John T.: Practical Pharmaceutical Control, *Bull. Am. Soc. Hosp. Pharm. 11*:262 (July-Aug.) 1954.
3. Francke, Don E.: *Hospital Formulary of Selected Drugs,* Hamilton Press, Hamilton, Ill., 1954.
4. Steiger, Kurt: Hospital Pharmacy in Switzerland, *Bull. Am. Soc. Hosp. Pharm. 10*:136 (Mar.-Apr.) 1953.
5. Recovery of Silver from Exhausted Fixers, *Am. Ann. Photography 41*:159, 1946.

naming of drugs on prescription labels

► UNLESS DISPENSED in original containers which have undetachable labels, most prescription labels bear only the name and address of the pharmacy, its prescription file number, the names of the patient and physician, and the latter's directions for use. The absence of any display of the name of the prescribed drug or drugs appears to be a matter of custom although intentional secrecy has been largely superseded by the use of English for writing prescriptions. Indeed, physicians frequently tell patients the name and nature of prescribed drugs unless there is a particular reason for withholding this information. Mutual confidence between physician and patient is likely to be enhanced by the plain designation of the principal ingredient(s) on the prescription label. The directions for administration are often too complex and varied to be encompassed on a small label; in some cases the warning to take only as directed may be the most useful inscription.

Identification of prescribed medication on prescription labels also may aid physicians other than the prescriber, as well as dentists, who may be consulted for the same or for a different ailment. Even the original prescriber may be unable to recall or find a record of the precise medication prescribed for a patient whom he has not examined recently. Moreover, the identification of a prescribed drug may be urgent in emergencies which involve a question of accidental poisoning, unintentional overdosage, or attempted suicide. Determination or confirmation of the exact identity of a previously prescribed drug in such cases may be hampered by the necessity for calling or contacting the dispensing pharmacy to obtain the information from the number of the prescription in its files. Such occasions, arising after closing hours, would involve even greater loss of time. There also may be other more or less urgent situations in which a clinic or private patient is obliged to consult or call an alternate physician for refill of a prescription, the identity of which can be determined only by contacting the office of the prescriber or the dispensing pharmacy. Indeed, on account of travel or changes of residence, patients may be put to extra expense because the identity and suitability of partly used prescriptions cannot be determined by another pysician.

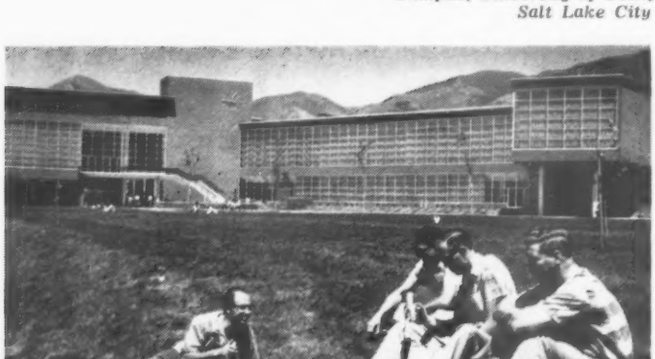
While display of the names of prescribed drugs on prescription labels can be advantageous, there are some patients for whom it may be unwise to reveal such information. These might include patients with mental disturbances, diseases known to have a fatal outcome, or any condition likely to be aggravated by a knowledge of its consequences, particularly if the name of the particular drug prescribed has a specific connection with the diagnosis. In such cases names which are therapeutically suggestive would be especially provocative. Another unfortunate aspect of prescription drug identification lies in the encouragement it may provide for sharing unused medication with another member of the household or a neighbor who has or is assumed to have the same illness. Because of wrong diagnosis, different stage of illness, or different dosage requirement, this could easily lead to serious consequences.

Although this is a delicate matter which should be left to the judgment of the physician in each individual case, it is suggested that with a somewhat larger section of the public than in former days the naming of drugs on prescription labels will work for good rather than for harm.

—J. Am. Med. Assoc. 169:148/1338 (Mar. 31) 1959.

(CREDIT: HAC RUME)

Student Union Building, Campus, University of Utah, Salt Lake City



SALT LAKE CITY

June 15-20

► HOSPITAL PHARMACISTS from all parts of the country will have an opportunity to participate in one of the two institutes scheduled during the year 1959. The first one will be held at the University of Utah, Salt Lake City, Utah during the week of June 15. The second institute is scheduled at the University of Chicago, Chicago, Illinois, August 3-7, 1959. Announcement and registration forms have been sent to all members of the AMERICAN SOCIETY OF HOSPITAL PHARMACISTS as well as to all hospital administrators in member hospitals of the American Hospital Association. Registration for the institute is handled through the American Hospital Association and applications are accepted in the order received. In accordance with the policy for setting up this type of meeting, the number of registrants is necessarily limited.

In each institute - Salt Lake City and Chicago - housing facilities will be available in dormitories at the Universities. Special arrangements have been made for members of religious orders. Meals will be served in the university cafeterias and arrangements for housing and meals can be made following notification of acceptance to the institute by the American Hospital Association.

Again, for the 14th consecutive year, the American Hospital Association will conduct the institutes in cooperation with the American Pharmaceutical Association and the AMERICAN SOCIETY OF HOSPITAL PHARMACISTS. In both cases, the local hospital organizations and the ASHP affiliated chapter in each area are assisting and arranging local plans.

Submitted by JOSEPH ODDIS, Staff Representative, Council on Professional Practice, American Hospital Association, Chicago, Ill.

A scene in the Pharmacy Department at Latter Day Saints Hospital, Salt Lake City

1959 INSTITUTES ON HOSPITAL PHARMACY

CHICAGO August 3-7

Program

Every effort has been made to incorporate the suggestions and ideas presented by Mr. Allen V. R. Beck, chairman of the ASHP Committee on Program and Public Relations and his committee members. The program will be based on six general themes - services to nursing units, departmental management, physical planning of the pharmacy, compounding and prepackaging, pharmacy and therapeutics committee and formularies, and professional services - around which each day's discussions will be based. Every effort has been made to present a very practical program and although the 1959 institutes will follow the same general pattern as in the past, the topics under discussion should propose new methods and procedures for those who have been engaged in the practice of hospital pharmacy for some time, and offer valuable assistance and aid to the relative newcomer in this field.

Recent activity by the Joint Commission on Accreditation of Hospitals, American Hospital Association and AMERICAN SOCIETY OF HOSPITAL PHARMACISTS recommending that strong Pharmacy and Therapeutics Committees be established has prompted the advisory committee to again place this subject in the institute program. With the introduction of the American Hospital Formulary Service, the advisory committee considered it essential that time be allotted for a discussion of the Service. In addition, a symposium entitled "Operating A Formulary System In Your Hospital" will be presented.

University of Chicago Clinics, Billings Hospital, Chicago

A scene from the Pharmacy Department University of Chicago Clinics

Faculties

SLC—Salt Lake City
C—Chicago

DONALD C. BRODIE, Ph.D., University of California, College of Pharmacy, Medical Center, San Francisco 22, California. (SLC)

RAY E. BROWN, Superintendent, University of Chicago Clinics, Chicago, Illinois. (C)

REED L. CLEGG, Assistant Manager, Veterans' Administration Hospital, Salt Lake City, Utah. (SLC)

WINSTON DURANT, Assistant Director, Pharmacy Service, University of Chicago Clinics, Chicago, Illinois. (C)

LOUIS GDALMAN, Director of Pharmacy Service, Presbyterian-St. Luke's Hospital, Chicago, Illinois. (C)

LEO F. GODLEY, Chief Pharmacist, Harris Hospital, Fort Worth, Texas. (SLC)

JACK S. HEARD, Director of Pharmacy Service, University of California Medical Center, Los Angeles 24, California. (SLC)

ARTHUR HARTFELDER, Controller, Evanston Hospital, Evanston, Illinois. (C)

DAVID L. HINER, Dean, College of Pharmacy, University of Utah, Salt Lake City, Utah. (SLC)

LEONARD W. JARCHO, M.D., Associate Professor of Medicine, University of Utah, Salt Lake City, Utah. (SLC)

LOUIS P. JEFFREY, Director of Pharmacy Service, Albany Hospital, Albany, New York. (C)

KENNETH E. KNAPP, Administrator, Thomas D. Dee Hospital, Ogden, Utah. (SLC)

CLIFTON J. LATIOLAIS, Director of Pharmacy Service, University Hospital, Ohio State University, Columbus, Ohio. (SLC and C)

RACHMIEL LEVINE, M.D., Chairman, Department of Medicine, Michael Reese Hospital, Chicago, Illinois. (C)

MORRIS LIPTON, M.D., Veterans' Administration Medical Research Hospital, Chicago, Ill. (C)

RUSSELL F. LOVELL, Director of Pharmacy Service, Akron General Hospital, Akron, Ohio. (C)

JOSEPH A. ODDIS, Staff Representative, Council on Professional Practice, American Hospital Association, Chicago, Illinois. (SLC and C)

JACK OWEN, American Hospital Association, Chicago, Illinois. (C)

PAUL F. PARKER, Director, Division of Hospital Pharmacy, Washington, D. C. (SLC and C)

ALBERT PICCHIONI, Ph.D., Professor of Pharmacology, University of Arizona, School of Pharmacy, Tucson, Arizona. (SLC)

SISTER M. GONZALES, Director of Pharmacy Service, Mercy Hospital, Pride and Locust Streets, Pittsburgh 19, Pennsylvania. (C)

SISTER M. REBECCA, 3000 Polk Avenue, Ogden, Utah. (SLC)

PETER SOLYOM, Director of Pharmacy Service, University of Chicago Clinics, Chicago, Illinois. (C)

EWARD A. SWINYARD, Ph.D., Professor of Pharmacology, College of Pharmacy, University of Utah, Salt Lake City, Utah. (SLC)

VERNON O. TRYGSTAD, Director of Pharmacy Service, Veterans Administration, Department of Medicine and Surgery, Washington 25, D. C. (SLC and C)

AARON TURNER, Controller, Veterans' Administration Hospital, Salt Lake City, Utah. (SLC)

NELLIE VANDERLINDEN, Chief Pharmacist, Latter Day Saints Hospital, Salt Lake City, Utah. (SLC)

DIXON M. WOODBURY, M.D., Associate Professor of Pharmacology, University of Utah, Salt Lake City, Utah. (SLC)

REGISTER EARLY

Applications for participation in the annual institutes are accepted in the order received. Those planning to participate in either of the 1959 institutes are urged to register as soon as the necessary application forms are received.

Again this year, a clinic session will be held at the end of each day's program. The student body will be divided into groups of appropriate size, according to the bed capacity of the institution with which the student is associated. Each group will be assigned a group leader who will act as moderator during each session. Each group will be asked to (1) evaluate the day's program, (2) offer suggestions and ideas for improving the program, and (3) discuss the day's program in terms of its application to the operation of the student's pharmacy department. A report of these clinic sessions will be made on the final day of the institute. Faculty members will act as resource advisors and participate in the discussions only as they are invited to do so.

Another session designed specifically for student participation is the "Question and Answer" period and problem clinic. Selected faculty members will serve as discussants. The students will be asked to present specific pharmaceutical problems as they exist in their respective institutions. The discussants will attempt to analyze the problem and offer suggestions for a solution.

The session "It Worked For Us" is designed to give the institute registrants an opportunity to discuss briefly a situation or problem which they have solved or a gadget which they have put to use. A faculty member will begin on the first day of the institute to interview the registrants who may have something to offer for this session. The institute registrants are encouraged to come prepared to participate in this session. The theme for this session might well be "If It Worked For Us, It May Work For You."

Other important sessions will deal with methods of dispensing patient drug orders, supervision and control of drugs on nursing units, expediting pharmacy orders, developing written policies and procedures, planning, organizing and maintaining the physical facilities, layout and design, and fixtures and equipment. Complete programs with tentative faculty appointments are included.

Local Committees

Members of the Utah Society of Hospital Pharmacists and Illinois Society of Hospital Pharmacists are taking a leading role in making special arrangements for institute enrollees. Spearheading this interest and activity are Miss Nellie Vanderlinden of Salt Lake City and Edward Hartshorn of Chicago.

At both institutes, preliminary registration and an informal coffee hour will be featured on the Sunday evening preceding the institute from 4 p.m. to 9 p.m. A social hour, scheduled for Monday evening, will offer an unusual opportunity for relaxation and entertainment. These functions are sponsored by the respective local societies.

1959 INSTITUTES - programs

Monday, June 15, Salt Lake City and August 3, Chicago

Services To Nursing Units

CLIFTON J. LATIOLAIS, Presiding at Salt Lake City and Chicago

9:00 A.M. Greetings and Orientation

9:20 A.M. Established Principles, Standards and Resources for Hospital Pharmacy

PAUL F. PARKER and JOSEPH A. ODDIS (SLC and C)

This session will serve to point out that hospital pharmacy is no longer a new entity; that there are established principles, standards, and resources where information is readily available. Two speakers will present the topic in a conversational manner employing visual aids, magnetic boards, etc. An attempt should be made to demonstrate the relationship of the Joint Committee of the American Hospital Association and AMERICAN SOCIETY OF HOSPITAL PHARMACISTS, the Joint Commission on Accreditation of Hospitals, the Policy Committee of the Division of Hospital Pharmacy.

The background of the development of these groups and their actual relationship to the practice of pharmacy in the individual hospital should be presented.

From this session, the student must be made cognizant of the efforts that have been exerted in the past for the advancement of hospital pharmacy and of the resources presently available and at his immediate disposal. He must recognize the representation which is his at the national level.

10:40 A.M. Methods of Dispensing Individual Patient Drug Orders

JACK S. HEARD (SLC)
LOUIS GDALMAN (C)

A description of recognized methods of processing individual patient drug orders should be presented. This presentation should include those methods dealing with drugs commonly stocked in the pharmacy and also drugs which must be obtained for a specific patient and which do not constitute part of the ordinary pharmacy stock (specific brand of drug, investigational drug, drug manufactured in foreign country, etc.). The weaknesses and strength of these methods should be discussed. Factors which have a bearing on the choice of method to be employed should be reviewed. Visual aid should be used in the presentation, if feasible. Blackboard demonstration, etc., is encouraged. Sample material for distribution to the registrants is advisable.

11:20 A.M. Methods of Dispensing Charge and Non-Charge Floor Stock

LEO F. GODLEY (SLC)
WINSTON DURANT (C)

Charge floor stock includes those drugs commonly found on nursing units, usually on a loan basis from the pharmacy to the nursing unit, for which a direct charge is made to the individual patient (intravenous solutions, ampuls, prepackaged units of tablets, etc.).

Non-charge floor stock includes those drugs commonly found on nursing units for which no direct charge is made to the individual patient.

A description of recognized methods of dispensing these drugs should be presented. How are these nursing unit drug stocks maintained? Who is responsible for replacement of used stock? Can this be accomplished without more paper work for nurses?

1:15 P.M. Supervision and Control of Drugs on Nursing Units

VERNON O. TRYGSTAD (SLC and C)

The American Hospital Association and American Society of Hospital Pharmacists have recommended: "To urge, through appropriate channels, that hospital pharmacists extend their responsibilities to include participation in programs dealing with the safe handling of drugs throughout the hospital."

This discussion should include methods of controlling drugs on nursing units. The speaker should offer suggestions for enlisting the nurses' cooperation. How are nursing unit inspections conducted? How often? By whom? What administrative and professional policies should be established?—regarding labeling, storage, transfer of medications, unused medications, narcotics, external drugs, biologicals, etc.

2:00 P.M. Expediting Pharmacy Orders

LEO F. GODLEY (SLC)
SISTER M. GONZALES (C)

This session should deal with methods of getting orders to the pharmacy and medications to the nursing units and patients expediently and efficiently. Delivery and courier systems should be discussed pointing out merits and deficiencies of such systems. How are emergency orders processed with such systems? Do these systems eliminate nursing trips to the pharmacy? What are the professional responsibilities involved? Pneumatic tube systems, dumb waiters, etc., should be mentioned briefly.

3:00 P.M. Providing Twenty-Four Hour Pharmacy Service

SISTER M. REBECCA (SLC)
RUSSELL F. LOVELL (C)

A number of methods have been suggested for providing "around-the-clock" pharmacy service—emergency cabinets, extending hours, on-call, intern and resident coverage, etc. These should be discussed in a general way describing the effectiveness of each system. It is important that the pharmacist recognize his responsibility for "around-the-clock" pharmacy service. Too often, pharmacy service after normal pharmacy hours is left to the nursing service. Pharmacy service should not end at 5:00 p.m. or 9:00 p.m. or midnight. If a pharmacist cannot be on duty "around-the-clock," what other alternatives have we?

3:40 P.M. Clinic Session Assignments

4:00 P.M. Clinic Session

Each afternoon, clinic sessions will be held. The student body will be divided into groups of appropriate size, according to the bed capacity of the institution with which the student is associated. Each group will be assigned a group leader who will act as a moderator during each session. Each group will be charged with three responsibilities: (1) An evaluation of the day's program, (2) Suggestions and ideas for improving the program, and (3) Discussion of the day's program in terms of its application to the operation of the student's pharmacy department. The moderator must encourage total participation in the discussion. He will serve as recorder and report to the institute coordinator daily after each clinic session. At the end of the week, a clinic session is held on the stage before the entire institute body, in which the discussion leaders and institute coordinators participate. All members of the faculty act as resource advisors and participate in the discussions only as they are invited to do so.

Tuesday, June 16, Salt Lake City and August 4, Chicago

Departmental Management

DONALD C. BRODIE, Presiding at Salt Lake City
WINSTON DURANT, Presiding at Chicago

8:30 A.M. Planning and Organizing

CLIFTON J. LATIOLAIS (SLC and C)

The pharmacy service which can be offered in the hospital is directly proportional to the care which has been taken in planning and organizing the pharmacy department. The speaker should outline steps that should be taken in planning the department from an administrative point of view. What is the scope of the service to be provided? Does the department have a policy statement outlining its purpose, function and responsibilities? Who is in charge of the department when the chief pharmacist is absent? What are the responsibilities of the pharmacy personnel? How are complaints from other departments handled and by whom? This session should also provide a setting for the next presentation.

9:10 A.M. Developing Written Policies and Procedures
PAUL F. PARKER and JOSEPH A. ODDIS (SLC and C)
This session will include a discussion and illustration of policies and procedures for hospital pharmacy practice.

Writing a procedural manual is a continuing process. Too often, pharmacists look upon this as an ominous task, beyond the realm of accomplishment. This outlook is due, in part, to a lack of understanding of the basic reason for having a procedural manual. It should be stressed that such a manual is developed gradually, a little at a time, as the need arises. Basic advantages for having the manual should be presented. What should be included? How does one start? Samples of policies and procedures should be distributed. Several manuals should be displayed.

10:40 A.M. Maintaining the Physical Facilities
LEO F. GODLEY (SLC)
PETER SOLYOM (C)
This session is designed to point out the need for constant periodical checking of the facilities to insure that optimum efficiency is achieved and personnel safety is assured. The speaker should list types of facilities such as typewriters, balances, weights, autoclaves, stills. Also, fire extinguishers, sprinkler systems, etc. Who is responsible for checking these? How often? What routines can be established?

11:20 A.M. Records and Reports
JACK S. HEARD (SLC)
LOUIS GDALMAN (C)
Types of records and reports which are used in hospital pharmacies should be discussed. This discussion should include those records and reports customarily required by law and others which have been adopted as a means of transmitting information to the administrator or other departments of the hospital. Intradepartmental records and reports should also be reviewed. Sample material distribution is encouraged.

1:15 P.M. Let's Examine the Pharmacy Budget
CLIFTON J. LATIOLAIS, KENNETH KNAPP, and AARON TURNER (SLC)
CLIFTON J. LATIOLAIS, JACK OWEN, and ARTHUR HARTFELDER (C)
Hospitals in recent years have become "big business." As with all big business operations, tools of management must be employed. One of these tools is the budget. More and more hospital administrators are employing the budget system as a valuable working tool. Department heads are being asked to prepare and live with realistic departmental budgets.

The hospital pharmacist, as a department head and responsible for a significant portion of the hospital dollar, must be prepared to develop and understand the budget system, its advantages and limitations.

This session will be a dramatization of a budget meeting. The participants will include a pharmacist, and administrator and a controller. Each participant will briefly discuss pertinent points which each should consider in preparing a pharmacy budget and in preparation for a budget session. The pharmacist will prepare a fictitious pharmacy budget for a 300-bed hospital, bearing in mind that the hospital is presently building a new addition and will be operating with 50 additional beds during the last six months of the year. He will defend his proposed budget in the meeting substantiating his request with data, trend figures, work loads, etc. Copies of the fictitious budget should be prepared for distribution to the students.

3:00 P.M. Job Specifications and Job Descriptions
VERNON O. TRYGSTAD (SLC and C)
The need for job specifications and job descriptions should be emphasized. These work for both the employer and employee in identifying the requirements needed to fit a particular position which will involve certain specific responsibilities. These will also serve to delineate responsibility among the employees. Samples should be distributed.

3:40 P.M. Supervision
REED L. CLAGG (SLC)
JACK OWEN (C)
Review of principles of supervision. The need for supervision, particularly of non-pharmacists personnel, should be emphasized. How is supervision achieved? What relationship is there between supervision and delegation of responsibility? What are some supervisory techniques?

4:20 P.M. Clinic Session

7:00 P.M. Questions and Answers

Wednesday, June 17, Salt Lake City and August 5, Chicago

Physical Planning Of The Pharmacy
VERNON O. TRYGSTAD, Presiding at Salt Lake City and Chicago

8:30 A.M. Layout and Design
PAUL F. PARKER (SLC and C)
A general discussion of factors to be considered in planning a new department or renovating an existing department. Scope of service (inpatient and outpatient), space requirements, work flow, etc. Access to utilities (elevators, stairways, etc.) and other services and departments; safety factors and security requirements; considerations such as electrical outlets, floor drains, ventilation, refrigeration, etc.

9:10 A.M. Fixtures and Equipment
LEO F. GODLEY (SLC)
LOUIS GDALMAN (C)
A general discussion of the various types of fixtures and equipment and relative merits and deficiencies of each. Fixtures might include open, closed, mixed systems and others. Equipment might include dispensing (balances, etc.), office (typewriter, adding machine, etc). and special (prepackaging, bulk compounding, etc.).

Compounding And Prepackaging

10:10 A.M. Improved Services and Increased Savings by Bulk Compounding
CLIFTON J. LATIOLAIS (SLC and C)
This presentation should first, advance the *service* aspects of a bulk compounding program and secondly, justify the establishment of such a program through savings to the institution. It should develop the relation of a bulk compounding program to the formulary system. Students should be advised to keep records on all aspects of the bulk compounding to know where they are going and what the *actual* costs are. Reliable cost figures might be quoted. Sample formulas might be distributed.

10:50 A.M. Developing a Bulk Compounding Program
CLIFTON J. LATIOLAIS, NELLIE VANDERLINDEN, JACK S. HEARD, and SISTER M. REBECCA (SLC)
CLIFTON J. LATIOLAIS, SISTER M. GONZALES, LOUIS P. JEFFREY, and PETER SOLYOM (C)
This will be a panel discussion. The theme of the presentation should develop a logical sequence for establishing a bulk compounding program; the basic equipment necessary, and its justification; the development of a long-range plan.

1:15 P.M. Preparing Sterile Products
JACK S. HEARD (SLC)
RUSSELL F. LOVELL (C)
This is a demonstration session. Equipment should be displayed and discussed. Equipment set-ups for certain sterile procedures should be demonstrated and described. Source for equipment, relative cost, etc., should be presented.

2:00 P.M. Quality Control
DONALD C. BRODIE (SLC)
LOUIS P. JEFFREY (C)
Pharmacists should be impressed with the need for having quality control as a routine part of any manufacturing or compounding process. Some of these control procedures should be described.

2:40 P.M. Clinic Session (SLC)

3:00 P.M. Prepackaging Pharmaceuticals (C)
WINSTON DURANT (C)
This session should deal with a discussion of techniques in prepackaging systems; control necessary; factors which determine necessity for prepackaging; who does the prepacking; items prepackaged (floor stock, clinic preparations, fast movers). What sequence should be followed in this development? What precautions should be taken? What are the advantages? Is such a program practical in a small hospital?

3:40 P.M. Clinic Session (C)

Thursday, June 18, Salt Lake City and August 6, Chicago

Pharmacy And Therapeutics Committee And Formularies
ALBERT PICCHIONI, Presiding at Salt Lake City
LOUIS GDALMAN, Presiding at Chicago

8:30 A.M. Pharmacy and Therapeutics Committee—Organization, Function and Operation
JOSEPH A. ODDIS, VERNON O. TRYGSTAD, DONALD C. BRODIE, LEO GODLEY, and CLIFTON J. LATIOLAIS (SLC)
SISTER M. GONZALES, VERNON O. TRYGSTAD, RUSSELL F. LOVELL, and CLIFTON J. LATIOLAIS (C)
Bulletin No. 16 of the Joint Commission on Accreditation of Hospitals strongly recommends that hospitals establish pharmacy and therapeutics committees. The American Hospital Association and the American Society of Hospital Pharmacists have approved the Statement on the Pharmacy and Therapeutics Committee outlining the purposes, organization and functions and scope of this committee.
This will be a panel discussion. Three factors—organization, function and operation—will be analyzed. The moderator will introduce the subject and the three panelists will each discuss one of these factors.
Typical questions which should be explored are:
Organization:
1. How is this committee formed?
2. What authority should it have?
3. Members? Officers? Meetings?

Functions:
1. Specific Functions?
2. How are they implemented?
3. What factors may influence the scope of activity of the committee?

Operation:
1. What happens in the first meeting?
2. What happens in the subsequent meetings?
3. Agenda? Conduct of meeting? Time? Place? Length of meeting?

Visual aids should be employed, if feasible. Samples of minutes, agendas and policies governing the committee should be distributed.

10:10 A.M. American Hospital Formulary Service
PAUL F. PARKER (SLC and C)
The speaker will describe in detail the purpose, operation, use, etc., of the formulary service. He will offer suggestions regarding its application in individual hospitals. Copies of the "formulary" will be displayed.

10:40 A.M. Operating A Formulary System In Your Hospital
JOSEPH A. ODDIS, SISTER M. REBECCA, and JACK S. HEARD (SLC)
JOSEPH A. ODDIS, SISTER M. GONZALES, LOUIS P. JEFFREY, and CLIFTON J. LATIOLAIS (C)
This is a symposium. This session will be developed by three pharmacists, each of whom will describe the formulary system and its operation in relationship and with respect to the:
1. Medical Staff
2. Nursing Staff
3. Pharmacy Staff

The symposium participants will outline the introduction, implementation, effectiveness, acceptance, limitations, adaptations, and restrictions, etc., of the formulary system on the respective groups.
Every effort should be made to point up obstacles encountered, problems solved and created, technicalities involved.
Early experiences in implementing the American Hospital Formulary Service should be cited.

Professional Services

1:15 P.M. Symposium On Drug Therapy
DONALD C. BRODIE, DIXON M. WOODBURY, LEONARD W. JARCHO, and EWART A. SWINYARD (SLC)
Dr. Donald C. Brodie, University of California College of Pharmacy, Medical Center, San Francisco, California, has accepted responsibility for planning the Symposium on Drug Therapy. Participants in the symposium will be notified by Doctor Brodie regarding their participation and responsibilities.

1:15 P.M. Pharmacy Newsletter (C)
LOUIS P. JEFFREY (C)
The speaker will describe the newsletter, offering suggestions for preparation, content, format, function, etc. Sample newsletters should be distributed.

2:00 P.M. Calculations For Preparing Electrolytes (C)
RUSSELL F. LOVELL (C)
Some basic principles of electrolyte balance should be discussed. Calculations involved in preparing common electrolyte solutions in a hospital pharmacy should be discussed. Problems should be prepared for the students and several calculations should be demonstrated on the blackboard.

3:00 P.M. Drug Information (C)
EDGAR DUNCAN (C)
Dissemination of drug information is logically the pharmacist's responsibility. How can this best be achieved? Who should receive? What type of information should be distributed? What methods can be employed? A description of pharmacy, library and reference facilities - texts, pharmaceutical literature, hospital and pharmaceutical journals, etc. What are the pharmacist's responsibilities to see that such current information as is necessary is always found on the nursing station? Distribution of sample material is suggested.

3:40 P.M. Effective Use of Tranquilizers (C)
MORRIS LIPTON (C)
Discussion of current trends in the use of "tranquilizing" drugs; success of treatments; toxicity; addicting properties, etc.

4:20 P.M. Clinic Session (SLC and C)

7:00 P.M. It Worked For Us
This session is designed to give the institute registrants an opportunity to discuss briefly a situation or problem which they have solved or a gadget which they have put to use. A faculty member will begin on the first day of the instiute to interview the registrants who may have something to offer for this session. The theme of this session - It Worked For Us - could be lengthened to include - It May Work For You.

Friday, June 19, Salt Lake City and August 7, Chicago

Professional Services (continued)
JACK S. HEARD, Presiding at Salt Lake City
PETER SOLYOM, Presiding at Chicago

8:30 A.M. Educational Programs For Nurses, Medical Interns and Residents
ALBERT PICCHIONI (SLC)
SISTER M. GONZALES (C)
The speaker will describe the educational programs which can be conducted by the hospital pharmacists in these specific areas. This presentation should include what should be taught to *whom* by *what* means (formal lectures, group discussions, informal meetings). What responsibilities does the hospital pharmacist have in this area? What are the advantages in conducting these programs? How does one conduct these programs?

9:10 A.M. Pharmacy Newsletter
SISTER M. REBECCA (SLC)
The speaker will describe the newsletter, offering suggestions for preparation, content, format, functions, etc. Sample newsletters should be distributed.

9:10 A.M. Oral Anti-Diabetic Drugs (C)
RACHMIEL LEVINE (C)
An informative presentation of the new oral agents for the treatment of diabetes; their value, toxicity, potential as compared to present day treatment.

10:10 A.M. Implementing Institute Information
VERNON O. TRYGSTAD (SLC and C)
The many suggestions and ideas presented during the institute week will be of little value if no effort is made to apply some of this knowledge. The speaker should suggest ways by which application and implementation might be accomplished.
Over-enthusiasm may also cause problems in having others accept new ideas. How do we "sell" new ideas to the administrator, medical staff, or other department heads?

11:10 A.M. Review Report To Administrator
CLIFTON J. LATIOLAIS (SLC and C)
A brief report prepared by a member of the faculty summarizing the institute proceedings will be read. A copy of this report will be sent to each registrant and his administrator. This should serve as an entree for the registrant in discussing the proceedings with his administrator.

11:30 A.M. Clinic Session Review
PAUL F. PARKER (SLC and C)
The institute coordinators and clinic session leaders will hold a clinic session before the student body. The purpose of the review session will be to highlight the areas of discussion in the individual daily sessions. Time permitting, an open discussion will follow.

1:00 P.M. Luncheon
Presentation of certificates.
DAVID L. HINER (SLC)
RAY E. BROWN (C)

Therapeutic Trends

edited by WILLIAM JOHNSON

New Diuretic

The diuretic response of U-5641-2 is distinctly dependent on the dosage employed. Significant response in sodium excretion and urine volume appears to occur at the 1,000 mg. dose. A slight additional increase in these effects was observed at the 2,000 mg. dose, but over one-half the patients experienced marked dizziness, nervousness, and drowsiness. The administration of a single 2,000 mg. dose, however, gave a significant increase in urinary volume occurring within two hours and lasting over six hours. In contrast to other diuretics, the increased excretion of sodium and chloride did not occur until 12 hours after administration. There was a very slight increase in potassium and bicarbonate excretion and a slight increase in *p*H. Other electrolytes were not significantly affected. Ford *et al*, in *J. Chron. Dis. 8*:694 (Dec.) 1958, point out that U-5641-2 possesses some tranquilizing properties, but the diuretic characteristic predominates. These potentialities warrant further examination and possible chemical modification. U-5641-2 was supplied by the Upjohn Co.

WILLARD HERSHBERGER

Numorphan

Numorphan (14-hydroxydihydromorphinone) is a new synthetic morphine-like drug with increased analgesic potency and is effective in patients not dependent on narcotics at dosages of 0.5 to 1 mg. At this dose it proved free of any side effects in the management of postoperative pain. Using the subcutaneous route of administration in rats, Numorphan was found to be 15 times as active as morphine and 2.5 times as active as dihydromorphinone. Toxicity was 1.5 times that of morphine and 0.3 times that of dihydromorphinone. Orally, Numorphan was twice as potent as morphine and 1.7 times as toxic. With chronic use in metastatic neoplastic disease, Numorphan proved entirely satisfactory in 38 of 45 patients. The dosages ranged from 0.5 to 25 mg. every 3 to 4 hours, with an average initial dose of 2 to 3 mg. The most frequent side reaction noted with long-term usage was dysphoria, which disappeared upon substituting Pantopon. Nausea and vomiting developed in two patients. Intravenous administration of 0.5 and 1 mg. of the drug 10 minutes prior to minor surgical procedures and oral endoscopic procedures proved unsatisfactory, however, because of a lack of sedative effect and suppressive action of cough. The addicting properties of this drug have not been definitely defined, but are thought to lie between morphine and dihydromorphinone. This addiction will not negate long-term usage. Cross tolerance with morphine and meperidine hydrochloride was also noted. Numorphan was supplied by Endo Products and described by M. L. Samuels *et al* in *South. Med. J. 52*:207 (Feb.) 1959.

SYLVIA SCHMIDT

Triquin—In Lupus Erythematosus

The speculative possibility of an enhanced effect on the lesions of lupus erythematosus by a combination tablet consisting of quinacrine 25 mg., hydroxychloroquine 50 mg., and chloroquine 65 mg. has been suggested. Quinacrine, because of its tendency to produce skin reactions, is the drug most likely to be displaced, in part or altogether, by either or both of the other two. This combination, Triquin, first designated as "APA," was given to 45 patients with chronic discoid lupus erythematosus and 3 with subacute systemic lupus erythematosus. In 31 patients the lesions became completely clear or almost completely clear. Side effects were minor and did not necessitate the discontinuance of the medication. These clinical observations described by Tye *et al* in *New Eng. J. Med. 260*:63 (Jan.8) 1959 are reasonably suggestive that the simultaneous administration of two or three of these drugs is more efficacious in some patients at certain times of the disease than any of them used alone. The significant effectiveness of this combinatioin of antimalarial drugs in the treatment of lupus erythematosus clearly indicates further study. Triquin was supplied by Winthrop Labs.

WILLARD HERSHBERGER

JB-318—A New Hallucinogen

The effects of a new drug, N-ethyl-3-piperidyl benzilate hydrochloride (JB-318), were studied by Osfeld *et al*. The results of this study on 39 subjects were reported in *Arch. Neurol. Psychiat. 81*:256 (Feb.) 1959. JB-318 is being used to investigate the higher

integrative and preceptive functions of the brain, rather than to develop analogies about the etiology of the illness. Dosages of 5 to 15 mg., orally, induced atropine-like peripheral autonomic effects. True toxic delirium was induced with doses of 20 mg. or greater. Unique effects of the drug found in the test were auditory hallucinations and the patients' unwillingness to take the drug a second time. Experiences of the immediate past or of early childhood largely determined the subject matter of the illusions and hallucinations.

RICHARD HARRISON

Hydrochlorothiazide For Congestive Heart Failure

A new oral diuretic, hydrochlorothiazide, was tested in 20 patients for its effect in conjunctive heart failure. The study conducted by Brest and Likoff was reported in *Am. J. Cardiology 3*:144 (Feb.) 1959. The drug on a milligram for milligram basis was found to be several times as potent as chlorothiazide. Nausea was the only side effect noted in this experiment. In just one patient of the 20 was this side effect severe enough to discontinue the treatment. The studies showed that hydrochlorothiazide markedly increased the excretion of water, sodium, and chloride, but there was no significant loss of serum sodium or potassium. In 16 of the 20 patients, congestive heart failure was successfully controlled. Only one showed no diuresis at all while on the medication. The drug is marketed by Ciba as Esidrix.

RICHARD HARRISON

Alpha-Ethyl-Thioisonicotinamide In Tuberculosis

A clinical investigation of the use of *a*-ethyl-thioisonicotinamide has been performed in 102 patients with pulmonary tuberculosis. The thioamide, a derivative of isonicotinic acid, but not of isoniazid, was given orally in tablets containing 0.25 gram of the drug. The usual dose was one gram per day as related by Brouet *et al.* in *Am. Rev. Tuberc. 79*:6 (Jan.) 1959. In 78 of the patients the drug was administered either alone or with another antimicrobial drug for a period of three months or more. Forty-three of 78 patients had a relatively recent disease, and in the remaining 35 patients the tuberculosis was chronic. This thioamide was often badly tolerated and gave rise to digestive disorders such as anorexia, nausea, or gastric irritation entailing either a cessation of weight gain or an actual loss of weight. It is believed, however, that the thioamide should not be used alone in the initial treatment of recently developed pulmonary tuberculosis, but should be administered in association with isoniazid. The results obtained when the thioamide was used in multiple-drug regimens, including isoniazid or isonazid and streptomycin, were considered to be most satisfactory. It is believed, therefore, that *a*-ethyl-thioisonicotinamide, as is the case with cycloserine and with viomycin, is a drug of great interest for the treatment of chronic, often serious, cases of pulmonary tuberculosis. When used in association with other drugs, the thioamide has brought about considerable improvement of the lesions and reversal of infectiousness in patients who had received much previous therapy but whose strains of tubercle bacilli were completely resistant *in vitro* to isoniazid and to streptomycin.

SYLVIA SCHMIDT

Phenyltoloxamine—Daytime Sedative

The comparative evaluation of daytime sedative or tranquilizer effects of phenyltoloxamine, phenobarbital, and placebo therapy was performed in 131 patients for 198 trials. By the method of clinical utilization duplicating every day practice, phenyltoloxamine, a well known antihistaminic, in doses of 50 mg. three to four times daily, was found to be a highly effective and safe daytime sedative. The placebo therapy was ineffectual, and occurrence of cumulative untoward reactions with 15 and 30 mg. doses of phenobarbital interfered with the sedative effect which occurred in 60 percent and 70 percent respectively. With phenyltoloxamine there was no evidence of any hypersensitivity manifestation, such as skin eruptions, liver dysfunction, alteration of blood elements, or urine constituents. This article was reported in *N. Y. State J. Med. 58*:3821 (Dec. 1) 1958 by Batterman *et al.* Phenyltoloxamine was furnished by Bristol Laboratories Inc.

WILLARD HERSHBERGER

New Disposable Enema

The new enema consists of a small plastic reservoir 1.5 in. (3.75 cm.) long containing 1 ml. of fluid. Incorporated in the reservoir is a flexible plastic nozzle 2 in. (5 cm.) long which has a stopper that must be removed before the nozzle is inserted into the rectum. The liquid medication is composed of a stearate in an aqueous glycerinated detergent base following the U.S.P. formula for a glycerin suppository. This new simple plastic device described by Philip Aries in *J. Am. Med. Assoc. 169*:708 (Feb. 14) 1959 was used on 19 children and 1 adult. This miniature enema proved to be more effective and easier to handle than suppositories and in most cases preferable to large enemas. No untoward side effects followed its use. There was no evidence of irritation, cramping, or seepage of the medication. The enema was supplied by Wampole Laboratories, Stamford, Conn. under the name of Rectalad Enema.

SYLVIA SCHMIDT

Timely Drugs

Dumone

COMPOSITION: Methyltestosterone and ethinyl estradiol.
INDICATIONS: In conditions for which androgen-estrogen therapy is indicated, particularly in elderly patients; in symptoms and sequalae of menopause, osteoporosis and tissue atrophy and/or mild psychic disturbances in geriatric patients.
SIDE EFFECTS AND CONTRAINDICATIONS: Undesirable manifestations of androgenic or estrogenic stimulation may occur; not recommended in patients who have or have had established or suspected mammary or genital malignancy.
DOSAGE: In majority of conditions, 3 tablets daily, reduced to 2 tablets daily after one or two weeks.
PREPARATIONS: Tablets containing methyltestosterone 4 mg. and ethinyl estradiol 0.008 mg.
PACKAGING: Bottles of 100 and 1,000 tablets.
SUPPLIER: Squibb.

Endrate

GENERIC NAME: Edathamil disodium.
INDICATIONS: In treatment of pathologic calcification—forms a soluble chelate with calcium; may be useful in management of intractable angina pectoris, scleroderma and porphyria; is an effective agent for treatment of digitalis intoxication.
SIDE EFFECTS AND CONTRAINDICATIONS: Since the drug may act as an irritant to tissues, care must be taken to avoid extravascular infusion; there is theoretical danger of hypocalcemia, and that healed, calcified tuberculosis may be reactivated; it is strongly recommended that the drug not be administered to patients with renal disease.
DOSAGE: Daily dosage is 50 mg. per Kg. of body weight, diluted with 500 ml. 5% dextrose or isotonic sodium chloride solution, and administered by intravenous infusion during a period of not less than 2½ hours; usual regimine is daily intravenous infusion for 5 days followed by 2 days without the drug, the cycle being repeated 3 times.
PREPARATIONS: Injection, 3 Gm. in 20 ml. ampuls.
PACKAGING: Boxes of 5 ampuls.
SUPPLIER: Abbott Laboratories.

Esidrix

GENERIC NAME: Hydrochlorothiazide.
INDICATIONS: An analog of chlorothiazide, longer acting and 10 to 15 times more potent; used alone or with ganglionic blockers in most conditions requiring diuretic action, i.e., congestive heart failure, nephrosis, toxemia of pregnancy, edema of pregnancy, premenstrual tension, and steroid-induced edema; also indicated in all grades and most types of hypertension, and as an adjunct in treatment of obesity.
SIDE EFFECTS AND CONTRAINDICATIONS: Dryness of mouth, weakness, lethargy and drowsiness, i.e., early symptoms of electrolyte imbalance; may also include occasionally, nausea, skin rash, anorexia, headache, restlessness, fatigue, and constipation.
DOSAGE: Single dose of 75 to 100 mg. given in morning, or divided into 2 or 3 doses.
PREPARATIONS: Tablets of 25 mg. and 50 mg.
PACKAGING: Bottles of 100 and 1,000 tablets.
SUPPLIER: Ciba Pharmaceutical Products.

Hydrodiuril

CHEMICAL NAME: Hydrochlorothiazide, a derivative of chlorothiazide (Diuril).
INDICATIONS: Edema, including congestive heart failure; renal disease; cirrhosis with ascites; edema and toxemia of pregnancy; hypertension, either alone or in combination with hypotensive agents.
DOSAGE: Orally, 25 to 50 mg. one to two times daily.
PREPARATIONS: Tablets of 25 mg. and 50 mg.
PACKAGING: Bottles of 1,000 tablets.
SUPPLIER: Merck Sharp & Dohme.

Oxylone

GENERIC NAME: Fluorometholone.
INDICATIONS: Contact dermatitis, atopic dermatitis, neurodermatitis, anogenital pruritus, and seborrheic dermatitis; topically, has 40 times the anti-inflammatory potency of hydrocortisone.
DOSAGE: Usually, 1 to 3 applications daily.
PREPARATIONS: Cream containing 0.025% fluorometholone; ointment containing 0.025% fluorometholone and 0.5% neomycin sulfate (Neo-Oxylone).
PACKAGING: Tubes, Oxylone, 7.5 Gm., and Neo-Oxylone, 7.5 Gm.
SUPPLIER: Upjohn Co.

Pheny-PAS-Tebamin

CHEMICAL NAME: Phenyl para-aminosalicylate.
INDICATIONS: Treatment of tuberculosis, particularly whenever combined with streptomycins and/or isoniazid.
SIDE EFFECTS AND CONTRAINDICATIONS: Should be used with extreme caution in those patients who have developed a salicylate idiosyncracy.
DOSAGE: Four grams, three times daily with meals.
PREPARATIONS: Powder, 1 level tablespoonful of which is equivalent to 4 Gm., and tablets of 0.5 Gm.
PACKAGING: Powder, 1, 5 and 25 pound containers; tablets, bottles of 500, 5,000 and 25,000.
SUPPLIER: Purdue Frederick Co.

Rubramin PC

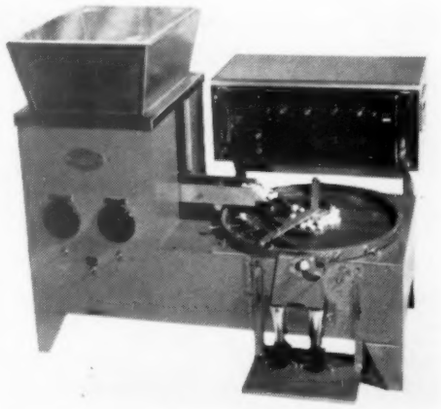
GENERIC NAME: Pure Cynanocobalamin U.S.P.
INDICATIONS: Uncomplicated pernicious anemia, pernicious anemia complicated by neurological involvement, macrocytic anemia, and sprue; also in certain related megaloblastic anemias; in massive doses it has proved effective for pain relief in trigeminal neuralgia, osteoarthritis, diabetic neuropathies, and polyneuritis associated with chronic alcoholism.
DOSAGE: Intramuscularly, subcutaneously or intravenously, as indicated by physician.
PREPARATIONS: Injection 30, 50, 100, or 1,000 mcg. per ml.
PACKAGING: Injection 30, 50 or 100 mcg., in 10 ml. vials; 1,000 mcg. in 1 ml. and 10 ml. vials.
SUPPLIER: Squibb.

Notes + Suggestions

edited by CLIFTON J. LATIOLAIS

ELECTRONIC TABLET AND CAPSULE COUNTER

The Triumph Electronic Batch Counter* may be used to prepackage different sizes and quantities of tablets, capsules, pills, etc. with 100 percent accuracy. This machine consists of a mechanical feeder combined with a electronic device and uses the photo-electric principle in the counting process.



Speed of counting is dependent mainly on operating speed and also the size of the tablet. The average speed (based on aspirin tablets) of the machine is capable of counting 1,200 to 1,500 tablets per minute. Smaller tablets are handled at a faster rate, and larger tablets at a slower rate. A variable speed motor may be regulated to maintain any desired production rate. Quantities from 1 to 1000 may be counted with the Triumph (Model T.B. 2) merely by controlling three dial switches—each controlling 100's, 10's and units.

The machine has a green stove-enamel finish and is 22½ in. high, 32½ in. long and 10½ in. wide. Approximate cost is $2175.00, F.O.B. New York City.

*Available from The Burnet Company, E. Midland Avenue, Paramus, N.J.

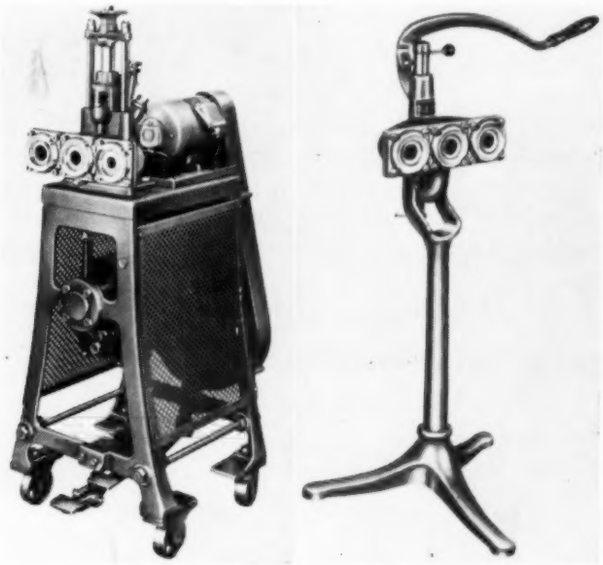
METHYLCELLULOSE

A 60 page booklet entitled *Methocel* is available from Dow Chemical Company, Midland, Michigan. This booklet includes descriptive information on the properties of methylcellulose in powder form, in solutions and in coatings and films in addition to the available viscosities, uses, solvents effect of additives, etc. on Methocel.

ALUMINUM FOIL SEALING MACHINE

The Hydraulic Triplex Sealing Machine* is used to affix aluminum foil overseals onto bottles, test tubes, syringes, etc. The aluminum overseals are available in various sizes and colors to seal different diameter openings of bottles, tubes, capsule vials, etc.

This aluminum seal provides an air-tight closure sufficient to maintain sterility within the counter. It also affords tamper proof protection.



The machine may be fitted with a variety of rubber sealing cups which will seal bottle neck diameters ranging from 13 to 42 millimeters. Sealing output of the semi-automatic model is approximately 1800 bottles per hour, while the output of the hand operated machine depends upon the proficiency of the operator.

Cost of the hand operated sealer is $200 and the electrically operated machine is $1200 delivered in the U. S., duty free.

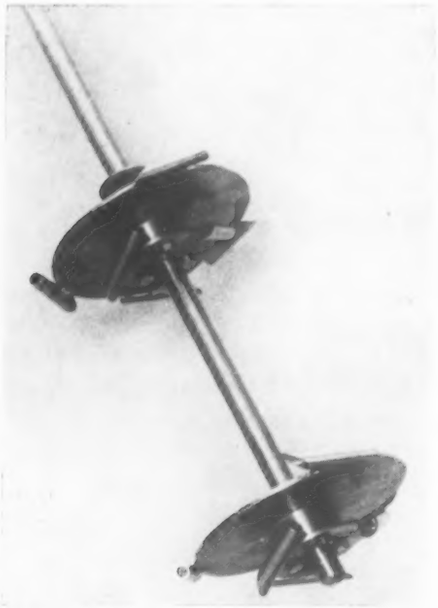
*Available from Anderson and Bruun Ltd., Stoke Park, Slough, Bucks, England.

CELLULOSE SEALS FOR BOTTLES

A new brochure describing Celons®—how they are manufactured, the different sizes and types available, how to measure for proper size, etc.—is available from The Celon Company, P. O. Box 311, Muscatine, Iowa.

STIRRING DEVICE

A new type of stirring paddle called the Impelator* combines centrifugal force, suction, shearing action, and counter whirl to provide an efficient intense mixing

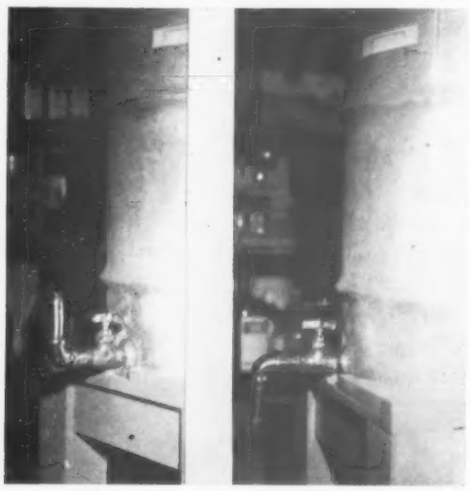


zone. This stirring device is designed for routine laboratory mixing of such preparations as emulsions, suspensions, lotions, solutions, etc. The unit is made of stainless steel and costs approximately $20.00 depending on the diameter and length of the stirring rod.

*Palo Laboratory Supplies, 81 Reade St., New York 7, N. Y.

SPIGOT ARRANGEMENTS FOR BARRELS

A unique arrangement for installing spigots on barrels used to dispense liquids in the hospital pharmacy is illustrated. This spigot arrangement is inverted



after use in order to prevent dripping of the liquid on the floor, thus eliminating unnecessary cleaning procedures. (Submitted by Leonard R. Gillett, 1346 E. 17th St., Salt Lake City, Utah.)

HYDROCORTISONE CREAMS

At the request of the British Pharmaceutical Codex Revision Committee and Joint Formulary Committee, an investigation was made to determine the stability of hydrocortisone alcohol and hydrocortisone acetate in aqueous emulsified bases. (Hadgraft, J. W. and Price, S. A. P., Hydrocortisone Creams, *Pharm. J. 180*:420 (May 31) 1958.) From the results of the study, the authors conclude that aqueous creams of hydrocortisone alcohol and acetate prepared by simple pharmaceutical technique, are equally stable* in cetomacrogol cream base and that the presence of a phosphate buffer at *p*H 7 is unnecessary. The suggested formula is as follows:

Hydrocortisone Alcohol (or Acetate)	1.0 Gm.
Chlorocresol	0.1 Gm.
Cetomacrogol Emulsifying Wax	9.0 Gm.
White Soft Paraffin	15.0 Gm.
Liquid Paraffin	6.0 Gm.
Purified Water, to make	100.0 Gm.

*Stability studies were carried out after one month storage at room temperature plus an additional six weeks at 45°C.

LABLINE CATALOG AVAILABLE

The availability of a new, 175-page catalog illustrating and describing more than 450 different pieces of instruments and apparatus is available from Labline, Inc., Chicago.

The catalog, covering a wide range of apparatus and equipment useful in both the laboratory and the plant, can be had without cost by contacting Labline, Inc., 3070-82 W. Grand Ave., Chicago 22, Illinois.

The 1959 catalog has embossed leatherette covers with multi-ring binders, and illustrates and describes such items as constant temperature baths; drying ovens; environmental units for humidity, altitude and low temperature; an extensive line of petroleum testing equipment; sectional laboratory furniture; bench and floor model centrifuges; ALUMALOY clamps; walk-in ovens; reach-in ovens to 1000° F.; incubators; incubating rooms; refrigerated baths; constant temperature cabinets; serological baths, meters; humidity indicators; and other useful apparatus for the laboratory and plant.

BOOKLET ON ELECTROLYTES AVAILABLE

A booklet entited, "Fluid Balance Without Tears," or "The Child's Guide to Electrolytes," is available from Mr. G. L. Bunton, F.R.C.S., University College Hospital, Gower Street, London, W. C. 1, England. The price is four shillings six pence plus three pence postage.

This article has been reprinted in the January-February (1959) issue of *The Hospital Pharmacist* (Canada).

News

Reamer Named Whitney Award Recipient

I. Thomas Reamer

I. THOMAS REAMER of Durham, North Carolina, has been named the 1959 recipient of the Harvey A. K. Whitney Lecture Award for his outstanding contributions to American hospital pharmacy.

The Whitney Lecture Award was established in 1950 by the Michigan Society of Hospital Pharmacists to honor the first Chairman of the AMERICAN SOCIETY OF HOSPITAL PHARMACISTS, Mr. Harvey A. K. Whitney, who was active for many years in hospital pharmacy organizations and was largely responsible for the creation of the ASHP.

Mr. Reamer was graduated from Highland High School, Highland, Maryland, and from the University of Maryland School of Pharmacy with a Ph.G. in 1924. He was engaged in retail work in the city of Baltimore during 1925, and from this time to July 1931, he served as Assistant Chief Pharmacist at The Johns Hopkins Hospital. Since July 21, 1931, he has been Chief Pharmacist at the Duke University Hospital and an Associate in Pharmacy at the Duke University School of Medicine.

Mr. Reamer participated in the Subsection on Hospital Pharmacy of the American Pharmaceutical Association and is a charter member of the AMERICAN SOCIETY OF HOSPITAL PHARMACISTS. He served as Secretary of the ASHP from 1943 until 1946 and as President for the 1950-1951 term. Mr. Reamer is also a past President of the Durham Drug Club and was a member of the North Carolina Board of Pharmacy from 1944 to 1947. He is a charter member and a member of the Executive Committee of the North Carolina Pharmaceutical Research Foundation. Mr. Reamer is a charter member of the Southeastern Society of Hospital Pharmacists and is presently Chairman of the Publicity Committee of the North Carolina Society of Hospital Pharmacists. He is also the ASHP representative to the Council of the American Institute of the History of Pharmacy.

Mr. Reamer has participated in many Institutes on Hospital Pharmacy as a lecturer. He was a delegate to the Pan-American Congress of Pharmacy in Lima, Peru, in 1951, and also a delegate to the meeting of the International Congress of Hospital Pharmacists in Basle, Switzerland in 1952. He has been a member of the Durham Lion's Club for many years and at present is Co-chairman of the Boy Scout Committee. Mr. Reamer is President and General Manager of Reaco Products, Inc., a wholesale drug distributing firm located in West Durham, North Carolina.

This award presentation will highlight a testimonial dinner scheduled for August 17, in Cincinnati, Ohio. The event is being held in conjunction with the Annual Meeting of the AMERICAN SOCIETY OF HOSPITAL PHARMACISTS and the Convention of the American Pharmaceutical Association.

Whitney-Spease Scholarship Fund

Establishment of the Whitney-Spease Scholarship Fund gives members and friends of the AMERICAN SOCIETY OF HOSPITAL PHARMACISTS an opportunity to pay special tribute to Edward W. Spease and Harvey A. K. Whitney, early leaders in the SOCIETY. Both served hospital pharmacy in the years which led up to the organization of the AMERICAN SOCIETY OF HOSPITAL PHARMACISTS; both were named honorary members of the SOCIETY in 1946; and both died in 1957 within a short time of each other.

Dean Spease is recognized for having established the first graduate program in hospital pharmacy at Western Reserve University School of Pharmacy where he served as Dean for 24 years. He is credited with the development of the first Minimum Standards for the practice of pharmacy in hospitals which was adopted by the American College of Surgeons in 1936, as criteria for the evaluation of pharmacy services in hospitals.

Harvey A. K. Whitney is recognized for his efforts in organizing the Sub Section on Hospital Pharmacy in the American Pharmaceutical Association, which grew into the AMERICAN SOCIETY OF HOSPITAL PHARMACISTS in 1942. He was the first Chairman of the SOCIETY. He is further recognized as a pioneer in the progressive development of hospital pharmacy practice and he established one of the early internship programs in the United States.

The Whitney-Spease Scholarship Fund is intended to encourage those interested in careers in hospital pharmacy and it will be administered through the AMERICAN SOCIETY OF HOSPITAL PHARMACISTS. Further plans for perpetuating this Fund are being considered and will be submitted to the Executive Committee for approval in the near future. Those wishing to contribute may tear the insert (opposite page 32) and forward it to the ASHP Treasurer, Sister Mary Berenice, St. Mary's Hospital, St. Louis, Missouri.

Members of the Committee responsible for establishment of the Whitney-Spease Scholarship Fund include Walter M. Frazier, *Chairman*, Springfield City Hospital, Springfield, Ohio; Alex Berman, College of Pharmacy, University of Michigan, Ann Arbor, Mich.; I. Thomas Reamer, Duke University Hospital, Dur-

ham, N. C.; and Evlyn Gray Scott, St. Luke's Hospital, Cleveland, Ohio.

AHA-ASHP Joint Committee Meets

The Joint Committee of the American Hospital Association and the AMERICAN SOCIETY OF HOSPITAL PHARMACISTS met at the Headquarters Building of the American Hospital Association in Chicago on March 6. Participants representing the A.H.A. included, Dr. Robert Cadmus, University of North Carolina Hospital, Chapel Hill, N. C.; Mr. C. P. Cardwell, Jr., Medical College of Virginia, Richmond, Va.; Mr. W. Keven Hegarty, Greater Bakersfield Memorial Hospital, Bakersfield, Calif.; Mr. John J. Zugich, University Hospital, Ann Arbor, Mich. Participants representing the ASHP included, George F. Archambault, U. S. Public Health Service, Washington, D. C.; Robert C. Bogash, Lenox Hill Hospital, New York City; Grover C. Bowles, Baptist Memorial Hospital, Memphis, Tenn.; and Mr. Clifton J. Latiolais, Ohio State University Health Center, Columbus, Ohio. Others present included Mrs. Gloria N. Francke, Secretary of the ASHP; Dr. J. R. Anderson, A.H.A. Committee on Professional Practice; Dr. Don E. Francke, Editor of the AMERICAN JOURNAL OF HOSPITAL PHARMACY; Mr. Joseph A. Oddis, Staff Representative of the Council on Professional Practice and Secretary of the Committee; Mr. Arthur Bernstein, Legal Council representing the A.H.A.; Mr. Winston Durant, University of Chicago Clinics, Chicago, Illinois; and Mr. Charles S. Paxson, Jr., Hahneman Hospital, Philadelphia.

Items considered during the meeting included a report of the Hahnemann Hospital "Substitution" Problem, development of a statement entitled "Guiding Principles in the Operation of the Hospital Formulary System," consideration of a career film on hospital pharmacy, use of tax-free alcohol and spirituous liquors in hospitals, status of Audit of Pharmaceutical Services in Hospitals, report on the American Hospital Formulary Service, plans for program at Convention of American Hospital Association, education programs for pharmaceutical manufacturers, and development of a "Manual on Hospital Pharmacy."

► CLAUDE BUSICK, Chief Pharmacist at St. Joseph's Hospital in Stockton, Calif. recently participated in the Institute on Nursing Service Administration which was held in Fresno. The Institute was sponsored by the American Hospital Association. Mr. Busick, who is a Past President of the ASHP, spoke on, "Interdepartmental Relationship of Pharmacy Affecting Nursing Service."

► RECIPIENTS OF AWARDS in the 1958 Pharmacy Week Display Contest included Sister Mary Oswalda, St. Joseph's Children's and Maternity Hospital, Scranton, Pa., who received first prize in the Hospitals and Clinics Awards. The second prize is awarded to Louis P. Jeffrey, Albany Hospital, Albany, N. Y., also in the Hospitals and Clinics Awards. The third prize in the same category is awarded to S. R. Marincik, California University Medical Center, San Francisco, Calif.

► LARRY PESA, Chief Pharmacist at St. Mary's Hospital in Passaic, New Jersey, recently participated in the Catholic Hospital Association's Institute for Disaster Planning held in Detroit, April 12 to April 17. Speaking on, "The Role of the Hospital Pharmacists in Disaster," Mr. Pesa discussed pharmaceuticals essential to mass casualty care, inventory needs for the initial phase, replenishment measures, and organization of pharmacy function for disaster. Mr. Pesa is also Chairman of the ASHP Committee on Disaster Planning.

► HANS S. HANSEN, a past president of the AMERICAN SOCIETY OF HOSPITAL PHARMACISTS (1946-1947 term), has recently been appointed Administrator of Selma Community Hospital, Selma, Calif. Mr. Hansen, who was active in the early years of the ASHP, was formerly Chief Pharmacist at Grant Hospital in Chicago, and more recently served as Administrator of Valley Children's Hospital, Fresno, Calif.

NPC Appoints Committee on Hospital Relations

A twenty-one man committee representing the National Pharmaceutical Council has been appointed to study industry's relations to hospital pharmacy. According to NPC's President, Mr. Carl K. Raiser, the committee will be designated the "Hospital Pharmacy Practice Committee" of the NPC.

Appointment of this committee follows NPC's selection last December of William E. Woods as assistant to the Executive Vice President, Newell Stewart, in the field of hospital relations. The committee will work closely with Mr. Woods.

Mr. Raiser said the committee's objective will be to continue through established liaison avenues to cooperate with physicians, hospital pharmacists and hospital administrators. "Wherever the need is indicated," he said, "NPC stands ready to join hands with the two great professions of medicine and pharmacy to improve and raise standards in the fields of hospital pharmacy and pharmaceutical manufacturing."

A. C. Scott, Manager of Hospital Sales, The Upjohn Company, will serve as committee chairman. Other members of the NPC Hospital Pharmacy Practice Committee are: E. M. Blake, Lederle Laboratories; Edward Brady, Mead Johnson & Company; G. Frazier Cheston, Smith Kline & French Laboratories; William N. Enes, Warner-Chilcott Laboratories; Daniel J. Fennelly, Jr., McNeil Laboratories,

Inc.; Paul Gerden, Abbott Laboratories; Charles W. Gill, The Wm. S. Merrell Co.; Charles Harrell, Bristol Laboratories Inc.; Robert Jacks, Pitman-Moore Company; John R. Kenny, Jr., E. R. Squibb & Sons; Charles B. McDermott, Winthrop Laboratories; Jed L. Mees, CIBA Pharmaceutical Products, Inc.; Daniel M. Minicucci, Chas. Pfizer Co., Inc.; R. H. Noel, Bristol Laboratories Inc.; Charles V. Owens, Ames Company, Inc.; Arthur F. Peterson, Geigy Pharmaceuticals; Owen J. Picton, G. D. Searle & Co.; Garth Quinn, Burroughs Wellcome & Co. (U.S.A.) Inc.; Parke Richards, Jr., Hoffmann-LaRoche Inc.; F. W. Schiller, Ortho Pharmaceutical Corp.; and Frank Walton, Merck Sharp & Dohme, Division of Merck & Co., Inc.

Hospital Pharmacist Addresses High School Students

High school students in Memphis, Tennessee, were addressed by Mr. Charles A. Champion, pharmacist at the John Gaston Hospital, during the recent vocational guidance conferences. The program, sponsored by the Memphis Urban League in cooperation with the local junior and senior high schools, took place at various schools during the weeks of March 30-April 3 and April 6-10.

Mr. Champion's topic was "The Scope of Pharmacy," using the following as source material for students interested in a career in pharmacy: Shall I Study Pharmacy? I'll Take Pharmacy, The Pharmaceutical Story, Why Should A Girl Become a Pharmacist? and Should You be a Pharmacist? Catalogues from several colleges of pharmacy were also displayed.

Each student participating in the guidance conferences received a copy of "Your Career Opportunities In Pharmacy," a publication available from the Chas. Pfizer Company.

Competition for Historical Writing in Hospital Pharmacy

The Committee on Historical Records of the American Society of Hospital Pharmacists, in cooperation with the American Institute of the History of Pharmacy, has announced plans for the 1959-1960 competition in historical writing in the field of hospital pharmacy. The deadline for the 1958-1959 competition was January 25, 1959, and papers submitted have been sent to the AIHP for judging. This year's recipients will be named at the Annual Meeting of the ASHP in Cincinnati in August.

Again, in the 1959-1960 competition, two hospital pharmacists who make a contribution toward either preserving or interpreting the historical records of hospital pharmacy will receive a recognition certificate and a gift membership in the American Institute of the History of Pharmacy. These awards will be made at the 1960 Annual Meeting of the Society.

Miss Adela Schneider, Chairman of the ASHP Committee, urges hospital pharmacists and the Society's fifty Affiliated Chapters to actively participate in this project. Interested hospital pharmacists are urged to begin work now on either of two projects:

1. Investigate some historical topic and submit a manuscript concerning it. Examples of suitable topics would be the history of your hospital; the history of your hospital pharmacy; the biography of an outstanding hospital pharmacist, notable either locally or nationally; or the history of a particular idea, practice, or organized activity.

2. Collecting, identifying and classifying printed and manuscript documents and also pictures on some facet of hospital pharmacy (as in No. 1 above), for deposit with some library or organization for later use in historical writing concerning hospital pharmacy. This type of entry in the competition may be either submission of the collection itself, or a detailed description of the collection with a statement concerning the place of deposit.

Entries for the 1959-1960 competition may be sent to: Miss Adela Schneider, Southern Pacific Hospital, Houston, Texas.

The Johns Hopkins Hospital Internship Program

The Johns Hopkins Hospital, in cooperation with the Graduate School and the School of Pharmacy of the University of Maryland, announces that internships in pharmacy are open to a limited number of 1959 or other recent graduates of recognized schools of pharmacy. Appointments are for a period of twenty-two months beginning September 1, 1959. During twenty months interns devote one-half time to hospital pharmacy training and one-half to graduate study. Full time training in the hospital pharmacy is required for two months during the summer of 1960. Four weeks of vacation are allowed during the term of appointment. Upon satisfactory completion of the internship and the course of study, Master of Science degrees are conferred by the University of Maryland and Certificates of Internship are awarded by The Johns Hopkins Hospital.

A stipend of $200.00 per month is provided by the hospital. The University of Maryland makes a reduction of 25 percent in tuition fees. The full graduate tuition is $12.00 per semester hour and thirty semester hours of work are required for the Master's Degree. In addition, there is a $10.00 matriculation fee and a $10.00 diploma fee. Complete information regarding curricula appears in the catalog of the School of Pharmacy, a copy of which may be secured by sending a request to the School of Pharmacy, University of Maryland, 636 West Lombard Street, Baltimore 1, Maryland.

Letters of application and other required information should be forwarded to Russell A. Nelson, M.D., Director, The Johns Hopkins Hospital, Baltimore 5, Maryland, not later than May 1, and appointments will be announced on or before June 1, 1959.

News

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Fischl To Receive Lascoff Award

Louis J. Fischl, F.A.C.A., of Oakland, California has been selected as the 1959 recipient of the J. Leon Lascoff Memorial Award, an award presented by the American College of Apothecaries to a pharmacist who has contributed substantially to the advancement of the profession of pharmacy and to the improvement of prescription practice in the country.

The award, named in honor of Dr. J. Leon Lascoff one of the original founders of the College, will be presented to Mr. Fischl at the annual banquet of the A.C.A. which will be held on Tuesday, May 19th at the Hotel Roosevelt in New Orleans and will highlight the final proceedings of the College's 1959 convention.

Hospital Pharmacists Speak on Accidental Poisoning

Accidental Poisoning in the Home was the topic of four discussions presented recently by members of the pharmacy staff at Jefferson Medical College Hospital. These groups were told that three out of four accidental poisonings involved children under five years of age, and that parents should do everything possible to store potential poisons out of reach of this age group. This age group is the one most difficult to teach about the dangers, and the group that usually touches an item and places it in the mouth.

These speaking programs are sponsored by the Greater Philadelphia Hospital Pharmacists' Association as part of its Twentieth Anniversary Celebration. Speakers were: Herbert Flack, Director of Pharmacy Service, who spoke to the monthly meeting of the National Executive Housekeepers' Association, Philadelphia Chapter, and who also addressed the Engineers' Club of Philadelphia; Neil Davis, Assistant Director of Pharmacy Service, who addressed the Lea School P.T.A., and Herbert Carlin, Chief of the Education and Research Division of Pharmacy Service, who addressed the Bache Grammar School P.T.A. These talks are given in cooperation with the Philadelphia Department of Public Health's Accident Prevention Unit and Poison Information Center.

► Mr. Alfred A. Mannino, Executive Director, Hospital Department of McKesson and Robbins, Inc., spoke recently before the Pharmacy Section of the Midwest Hospital Convention in Kansas City, Missouri. In discussing inventory and stock control management, Mr. Mannino stated that "a sound buying program and a good inventory procedure is vital to the success of every hospital pharmacy. Every buyer must have a plan or formula to aid in anticipating his requirements and maintaining minimum stocks."

Mr. Mannino reported that the hospitals of America purchased $350 million worth of pharmaceuticals in 1958, which represents an increase of 850 percent of 1929 purchases. Hospital purchases of pharmaceuticals in 1958 represented 26 percent of the total ethical pharmaceuticals produced in America.

Pharmacy Department Sponsors Booth at Annual Health Exhibit

The Pharmacy Department of the Akron City Hospital sponsored the booth for the Hospital at the Annual Health Exhibit of the Summit County Medical Society Auxiliary. The theme of the show, "To Safeguard Today's Health for Tomorrow," offered an opportunity to show progress of the Pharmacy Department at Akron City Hospital with photographs showing "Yesterday's" and "Today's" pharmacies. In addition to mentioning a few of the drugs available in 1939, 1959, and those that might be available in 1979, some indication was given as to the cost of these and benefits which might be derived. This illustrated that value received, not cost, is the basis for proper consideration in the selection of drugs. Also shown were scale diagrams with cut-outs representing the members of the staffs, giving a comparison of yesterday and today.

The Exhibit which received many favorable comments, was prepared under the direction of Mr. Russell Lovell, Chief Pharmacist at Akron City Hospital, Akron, Ohio.

Exhibit sponsored by Pharmacy Department at Akron City Hospital, Akron, Ohio at Annual Health Exhibit

American Society of Hospital Pharmacists affiliated with American Pharmaceutical Association

TO: Every Member of the American Society of Hospital Pharmacists

The American Society of Hospital Pharmacists has entered a new era – a new era of membership and organization. During the 1958-1959 year, we have accepted our 3000th member and equally as important, the Executive Committee has approved the constitution of the 50th affiliated chapter. These two significant milestones in the Society's brief but epoch making history should act as an incentive to all our members for the continuation and expansion of these activities.

During this past year, the Committee on Membership and Organization, through its 55 members, has developed and implemented a definite plan for membership. Many of you are aware of it and some have been actively participating in the over-all drive. The responsibility of obtaining new members should not be delegated to any one committee for any one year, but it should be the responsibility of *every* member of the Society. It is my personal opinion, that the Society's most important asset is its membership. To increase our membership is to increase our assets. This provides the future of hospital pharmacy with security. *We Need New Members.* There are many practicing hospital pharmacists who are not members of this Society. These men and women should be contacted by you and encouraged to join by stating to them the background, advantages, facilities, and requirements of the American Society of Hospital Pharmacists.

It would be idealistic to say that we would like to see all practicing hospital pharmacists as members of the ASHP and the A.Ph.A. A more realistic approach would be to try to contact every practicing hospital pharmacist who is not a member of the Society and discuss why he is not a member. This is a start in the right direction. In doing this, we will cover a lot of ground.

Before closing, I should like to make two requests. First, to ask all the members of the Society to go out and sign up a new member, *now*. Not next week or next month, but today or tomorrow. Second, that every Chief Pharmacist discuss with his pharmacist staff members, the American Society of Hospital Pharmacists and its organization. If we all make a sincere effort to do these two things, the work of the Committee on Membership and Organization would be alleviated.

Louis P. Jeffrey

Albany Hospital
Albany, New York

LOUIS P. JEFFREY
Chairman, Committee on
Membership and Organization

SELECTED PHARMACEUTICAL ABSTRACTS

and summaries of other articles interesting to hospital pharmacists

edited by CLIFTON J. LATIOLAIS, HENRY J. DEREWICZ *and* LEO F. GODLEY

SURFACE ACTIVE AGENTS IN PARENTERALS

Surface Active agents in Parenterals, Charnicki, W. F., Am. J. Pharm. 130:409 (Dec.) 1958. (Merck Sharp & Dohme Research Division, West Point, Pa.)

The author reviews the application of surface active agents in parenteral dosage forms. A definition of the term "surface active" is given along with a brief discussion on the application of anionic, cationic and nonionic agents.

A report is given on the application of a new commercially available agent known as "Miranal C2M," which is an amphoterian substance embracing the properties of either an anionic or cationic surfactant, depending upon the *p*H of the solution.

Attention is focused, however, upon the more widely accepted agents with emphasis as to their application to parenteral solutions and the toxicological problems encountered therein.

THOMAS E. ARKINSON

STEREOISOMERISM

A Review of Stereoisomerism, Martin, J. W., Am. Profess. Pharmacist 24:907 (Dec.) 1958. (Butler University, Indianapolis, Ind.)

The concept of stereoisomerism is reviewed by the author with major emphasis placed upon the basic theory involved. The importance of this theory in understanding drug actions is stressed by presenting examples of common therapeutic medicinal agents whose activity depends upon which isomer is employed. The author also emphasizes the importance of the pharmacist understanding the terminology associated with optically active medicinal agents.

HENRY J. DEREWICZ

SOLUTIONS OF GLUCOSE, STERILIZATION OF

Shortening the Sterilization Process of Glucose Solutions in Autoclaving, Soucek J. and Jezkova Z., Ceskoslovenska Farmacie (Czechoslovakia) 8, 1:14 1959.

In view of the fact that various pharmacopeias prescribe different times for autoclaving solutions of glucose, the authors have undertaken a study aimed at clarification of this problem. Solutions of 5% glucose were artificially contaminated by the commonest pathogenic microbes, that is *B. coli, Staphylococcus albus, Staphylococcus pyogenes aureus haem., Corynebacterium pseudodiphtheriae, B. subtilis, et cetera,* and then autoclaved at 1 atmosphere for different time periods. It was ascertained that an autoclaving of 2 minutes at 1 atmosphere was, for solutions contained in flasks of 100 ml. and 500 ml., completely sufficient for killing the microbes. As it is necessary to take also into account the time which is needed for the temperature to reach 120° C the total time required for a safe sterilization in an autoclave was found to be 8 minutes. Based upon their results the authors thus suggest to shorten the usual duration of autoclaving from 20-30 minutes to 8 minutes only.

HUBERT ZACEK

SEPARATION OF ALKALOIDS

Separation of Strychnine and Brucine by Means by Countercurrent Distribution, Waksmundzki, A. and Soczewinski, E., Acta Poloniae Pharmaceutica 15:279, 1958.

In order to establish the most favourable conditions for separating brucine and strychnine by countercurrent extraction, the authors undertook measurements of the partition ratios of these alkaloids for various systems and at various *p*H values of the water phase. The system: chloroform-citrate-phosphate buffer proved to be unsuitable; similarly, in the system: chloroform- succinate-borate buffer, the partition ratios of the alkaloids differ but slightly.

On the other hand, using the system: benzene - citrate-phosphate buffer a considerable difference in partition ratios has been found. It appears that, at a *p*H value equalling 7,2, the geometrical mean of the partition ratios equals 1. Subsequently, the authors determined the partition isotherms of the two alkaloids in the system: benzene-citrate-phosphate buffer at the *p*H value equalling 7,2.

Applying this system, the authors put through their countercurrent extraction in Craig's apparatus, obtaining complete separation of both alkaloids.

AUTHOR'S ABSTRACT

SODIUM LAURYL SULFATE STABILITY

Hydrolysis of Alkyl Sulfates, Read R. and Fredell W., Drug and Cosmetic Ind., 84:178 (Feb.) 1959. (Warner-Lambert Research Institute, St. Louis, Mo.)

A study is performed to determine the degree of hydrolysis of sodium lauryl sulfate at various hydrogen ion concentrations and temperatures. Since buffering was not a factor considered in the study, solutions of liquid sodium lauryl sulfate (29 percent pure) and powder (99 percent pure) were adjusted to various *p*H with variations in temperature in order to determine titratable acidity as a measure of hydrolysis. Since upon hydrolysis, acid sulfate is released with a subsequent lowering of *p*H, the *p*H levels were not constant. Hydrolysis produced varied from 0-100 percent as a result of laboratory conditions being varied to encompass *p*H ranges from 10-1.1 and temperatures from room to boiling. Results of the study indicate that (a) Sodium lauryl sulfate is inherently stable, being neutral in solution; (b) Higher temperatures accelerate decomposition; (c) Solutions having *p*H values higher than 3 do not exhibit rapid change and, when the *p*H is above 5, do not show hydrolysis even at highest "shelf" temperatures; (d) At very high temperatures (near boiling) and hydrogen ion concentrations, breakdown can be very rapid; (e) Spot heating can start hydrolysis with the resultant local low *p*H initiating such widespread breakdown as to result in total loss; (f) Since hydrolysis is slow at *p*H levels above 4, buffering at these levels should result in prolonged stability.

HENRY J. DEREWICZ

EXTRACTION OF ANTIBIOTICS

Paper Chromatographic Method for the Determination of Suitable pH Values for the Extraction of Antibiotics, Betina, V., Nature, London, 182:796 (1958).

*p*H Chromatograms are determined only when cultures of antibiotically active micro-organisms are available, before even crude substances have been isolated. The solubility of the antibiotic in 10 solvents (distilled water, 3% w/v ammonium chloride, methanol, acetone, ethyl acetate saturated with water, n-butanol saturated with water, chloroform, benzene, light petroleum, and ether saturated with water) is determined as follows. Agar plugs cut from colonies of the micro-organisms are placed in contact with filter paper strips for 15-50 minutes. The latter are dried, and chromatographed by ascending technique with each of the above solvents, and the spots detected bioautographically. *p*H Chromatograms are then run with the most suitable solvent on a series of paper strips buffered with McIlvain citrate-phosphate

buffers of pH 2.2, 3, 4, 5, 6, 7 and 8, and with phosphate buffers of pH 9 and 10 respectively, using the same technique, and allowing the solvent front to advance 15 cm. in each case. The pattern of spots obtained is a characteristic of each antibiotic. Acidic substances advance further with acid buffers, while basic substances advance further with alkaline buffers. The movement of neutral antibiotics is unaffected by pH. R_F values are dependent on the partition coefficient of the antibiotic between the organic and aqueous phases, and extraction with an organic solvent will be most successful at the pH value which gives the highest R_F value. Conversely re-extraction into aqueous media will be most effective at that pH at which the R_F has a low value.

FROM J. PHARM. PHARMACOL. 9:175, (MAR.) 1959 *(Abst.-J.B.S.)*

THIAMINE ASSAY

A Study of the Gravimetric Silicotungstate Method of Assay for Thiamin, Vannatta, E. E. and Harris, L. E., J. Am. Pharm. Assoc., Sci. Ed. 48:30 (Jan.) 1959. (College of Pharmacy, Ohio State University, Columbus, Ohio.)

The factors affecting the method of the 1953 *British Pharmacopoeia* for the assay of thiamin have been investigated. An improved procedure is presented and its application is demonstrated. The advantages of the proposed method, with respect to the fluorometric and other methods with which it has been compared, are: greater accuracy, increased specificity, less time-consuming, inexpensive apparatus and reagents, less tedious operations, and direct interpretation of data which does not involve the use of a reference standard.

AUTHOR'S ABSTRACT

CALCIUM ACETYLSALICYLATE, STABILITY OF

Study of the Stability and Stabilization of Calcium Acetylsalicylate, Kral J., Kylarova J., and Stastnikova E., Farmacia (Czechoslovakia)28, 1:14 (Jan.) 1959.

In this paper, the results of a study of the stability of calcium acetylsalicylate and of some methods of its stabilization are communicated. Calcium acetylsalicylate prepared especially for this purpose by the reaction between acetylsalicylic acid and calcium acetate was stored at normal temperature in glass containers under different conditions, *i.e.* in open or closed containers, and in a dry or humid atmosphere; in these circumstances the stabilizing effect of ammonium chloride, glucose, lactose, and calcium chloride in various concentrations was evaluated. Unlike the reports of other authors, the addition of glucose, lactose, and ammonium chloride proved to be ineffectual whereas the best results were obtained in case of an addition of 1% calcium chloride. Calcium acetylsalicylate stabilized in this way remained stable under normal conditions over a period of 18 months; in case of storage in humid atmosphere the decomposition was observed after 12 to 15 months.

HUBERT ZACEK

SUNSCREEN LOTION EVALUATION

A Method for Evaluating Sunscreen Lotions, Parke R. and Sperandio G., Drug Standards, 27:9 (Jan.-Feb.) 1959. (School of Pharmacy, Purdue University, Lafayette, Ind.)

A method for evaluating sunscreening agents is devised and proved practical, utilizing a chemical detector of ultraviolet camera film. It is felt that camera film would serve as a suitable cumulative detector of small quantities of ultraviolet rays which would pass through the translucent sunscreen lotions in their final product form. Advantages of this method would be that the product would be tested in its final form and that the method would be inexpensive and simple to use and would give a permanent record of the testing. A sunscreen lotion of the oil and water emulsion type was prepared, using five organic sunscreening agents and a silicone oil in different combinations. Periodic film tests indicated that the silicone oil was selective in potentiating the ultraviolet absorbing power of sunscreen agents in liquid emulsions. However, the silicone oil had no apparent effect on the stability of the action of the sunscreen lotions. Also, the silicone oil was extremely weak in its ability to absorb ultraviolet light and was of no value as a sunscreen agent in liquid emulsions. An important observation in this work is that the silicone oils are like other sunscreen lotion adjuncts in that they cannot be added to lotions containing any sunscreen agent with the assurance that the ultraviolet absorbing properties of the lotion will be increased. It is indicated that the silicone oils possess a selectivity of potentiation of sunscreening ability.

HENRY J. DEREWICZ

DETERMINATION OF DIETHYLSTILBESTROL

A Colorimetric Assay for the Determination of Diethylstilbestrol, Duerr, J. D. and Pappas, B. A., J. Am. Pharm. Assoc., Sci. Ed. 48:13 (Jan.) 1959. (Charles Pfizer and Company, Inc., Brooklyn, N. Y.)

The authors describe a procedure whereby the concentration of diethylstilbestrol can be determined in pharmaceutical preparations. When a mixture of concentrated sulfuric acid and aqueous ferric chloride is added to an alcoholic solution of diethylstilbestrol, an intense violet color is produced. The violet color has been found to be proportional to the concentration of diethylstilbestrol present, but only over a small range. The range is, however, sufficiently large enough to permit accurate determinations using a Cary Recording Spectrophotometer. Pharmaceutical products containing diethylstilbestrol, especially in tablet form, can be assayed using the procedure outlined, and the results compare favorably with those obtained using the official U.S.P. assay.

A. GORDON MOORE

ULTRASONIC EXTRACTION

Ultrasonic Extraction of Alkaloids, Drabent, Z. and Podeszewski, Z., Acta Poloniae Pharmaceutica 15:271, 1958.

The authors have investigated the feasibility of ultrasonic extraction of aklaloids. As raw material they used *Semen Strychni, Cortex Chinae* and *Lupinus Luteus*. Their experiments they carried out by means of a piezoelectric generator of 500 Kc frequency and approximately 8 W/cm² power

They ascertained that the maximum amount of alkaloids in the extract is already obtained after but 4-6 minutes ultrasonic treatment of the raw material. The authors also suggest application of ultrasonic waves for the extraction of alkaloids when analyzing them quantitatively.

AUTHOR'S ABSTRACT

STERILITY OF ANTIBIOTIC OPHTHALMIC OINTMENT

Sterility of Antibiotic Ophthalmic Ointment, Bowman, F. and Holdawsky, S., J. Am. Pharm. Assoc., Sci. Ed. 48:95 (Feb.) 1959. (Food and Drug Administration.)

A survey was conducted by the authors to determine the sterility of antibiotic ophthalmic ointments. Although sterility tests are not required, the Food and Drug Administration does insist that manufacturing facilities be capable of producing essentially sterile products. Forty-six samples representing nineteen batches from a total of ten different manufacturers were tested. Test procedures were identical to those established by previous investigators. Only ten percent of the batches were found contaminated, in contrast to approximately six times that percentage reported by previous investigators.

THOMAS E. ARKINSON

ALGINATE AS FILTER

Ammonium Alginate Wool as a Filter for Collecting Micro-Organisms from Large Volumes of Air, Hammond, E. C., J. Gen. Microbiol. 19:267 (1958).

Filters containing ammonium alginate wool were sterilized by autoclaving at 19 lb. wt./sq. in. for 30 minutes. Air containing the test organism (*Bacillus subtilis*), either in the form of an aerosol or of a dry dust prepared from sifted soil was blown through the filters at speeds varying from 1 to 5 cu. ft./min., any organisms which had passed through the alginate wool being collected on membrane filters. The alginate wool from each filter was dissolved in a sterile 0.5% solution of dipotassium hydrogen phosphate and samples plated out with glucose nutrient agar and incubated at 30° for three days. The membrane filters were shaken with 0.5% sodium chloride solution and glass beads and the solution plated out with

nutrient agar. In these experiments, ammonium alginate wool retained the dry spores of *B. subtilis* with an efficiency of 99.13 to 99.96%. It appeared to be 100% efficient for microorganisms of diameter greater than 2_{μ}, including the majority of yeasts and moulds.

FROM J. PHARM. PHARMACOL. 9:180 (MAR.) 1959
(Abst.-G.B.)

PYROGENS

Pyrogens, Bacterial, Determination of the Components of, by Chromatography, Macek, K., and Hacaperkova, J., Ceskoslov. Farm. 7:300 (1958).

A sample of pyrogen (200 mg.) is hydrolyzed by heating with dilute sulphuric acid and the purines are precipitated by silver sulphate. Sugars are detected by chromatography on Whatman No. 1 or No. 3 paper with *n*-butanol:-pyridine: water (6:4:3) as solvent system; the spots are located by spraying the paper with a reagent comprising 4% ethanolic aniline, 4% ethanolic diphenylamine and 85% phosphoric acid (5:5:1). For the detection of glucose, mannose and galactose the chromatogram is moistened with yeast suspension, incubated for 2 hours at 38°, and then treated with diphenylamine reagent. In the separation of purines, water-saturated n-butanol containing 5% of formamide is used as solvent. For amino acids the solvent system *n*-butanol:acetic acid:water (4:1:5) is used. Results are given for pyrogens produced by *S. typhimurium*, *E. typhi*, *P. vulgaris* (Westphal), *P. vulgaris* (Dare) and *S. abortus equi.*

FROM J. PHARM. PHARMACOL. 9:181 (Mar.) 1959
(Abst.-E.H.)

PROCAINE ASSAY

A Photoelectric Colorimetric Method for the Estimation of Procaine, Barakat M., Shehab S. and El-Shabrawi M., Drug Standards 27:27 (Jan.-Feb.) 1959. (Veterinary Medicine Faculty, Giza, Cairo, Egypt.)

A simple and rapid method for the determination of procaine in pure solutions and in pharmaceutical products, giving accurate results, is advanced. The method is based on the color reaction of aqueous 0.2 percent sodium 1,2-napthaquinone-4 sulfonate with procaine hydrochloride (intense red in concentrated solutions and orange-red in dilute solutions). The color is immediately obtained by mixing procaine hydrochloride solution with the reagent at room temperature and the intensity is directly proportional to the procaine content. The color is stable for more than 24 hours and is not affected by the action of heat; the intensity of the color is applicable even to such low concentration as 20 mcg. of procaine hydrochloride.

HENRY J. DEREWICZ

POLYETHYLENE GLYCOL INTERACTIONS

Interaction Between High Molecular Weight Polyethylene Glycols and Some Pharmaceuticals, Chakravarty D. and Lach J., Drug Standards, 27:6 (Jan.-Feb.) 1959. (College of Pharmacy, University of Iowa, Iowa City, Ia.)

A study of the interaction of some high molecular weight polyethylene glycols with pharmaceuticals is made, utilizing the solubility method, cloud paint method, and dialysis method, all of which are described by the authors. The molecular weights of the glycols ranged from 20,000 to several million. The glycols used in this study were PEG 20M and a series of Polyax WSR-35, WSR-205, WSR-301 and WSR-701. Medicinal agents used included *p*-hydroxybenzoic acid, *p*-aminobenzoic acid, salicylic acid, resorcinol and phenol. Results of the study indicated that Polyax undergoes some complex formation with salicylic, *p*-aminobenzoic and *p*-hydroxybenzoic acids. Also observed was a complex formation between phenol or resorcinol with PEG 20M. Also detected was a slight interaction between the Polyax and all the medicinal agents except salicylic acid.

HENRY J. DEREWICZ

CHEMICAL ASSAY OF 5-CHLORO-7-IODO-8-HYDROXYQUINOLINE

A Simple and Rapid Method of Chemical Assay of 5-Chloro-7-Iodo-8-Hydroxyquinoline-An Amoebic Drug, Mukerje S. and Dey A., Drug Standards, 27:18, (Jan.-Feb.) 1959. (Albert David Laboratories Ltd., Calcutta.)

A convenient method for the routine laboratory analysis of 5-chloro-7-iodo-8-hydroxyquinoline (Vioform, Ciba) is described which eliminates much of the cumbersome or inaccurate methods involved in both the N. N. R. 1941 and U.S.P. assays. The proposed method involves conversion of organic halogen into alkali halides by simple fusion with anhydrous sodium carbonate, as described in the *British Pharmacopoeia* (1953) for fusion of the corresponding 5,7-iodo derivative and estimating the alkali iodide formed through KIO_3 titration, using a KCN solution as described in the *British Pharmacopoeia* (1953) for K_T estimation and calculating the chloride content by difference of the iodide and total halide values as obtained by direct titration, in terms of total standard silver nitrate solution consumed. The advantages of this method are: (a) simple procedures for fusion; (b) economic, so far as reagents employed; and (c) convenient in operation and less time consuming.

HENRY J. DEREWICZ

ROUMANIAN PHARMACIES, ACTIVITY OF

Study of the Development of Pharmaceutical Compounding and Dispensing in Bucharest in the Period between 1946 and 1956 and of its Influence upon the Activity of Pharmacies, Fyrshirotu Z. and Marinescu J., Aptechnoe Delo (U.S.S.R.) 7:76 (Nov.-Dec.) 1958.

When studying the pharmaceutical compounding and dispensing in pharmacies of Bucharest it was found by the authors that the number of prescriptions in 1955 was 386% in comparison to that of 1946. Solutions for external use, solutions for internal use, and divided powders were prepared most frequently. However, not only the activity of pharmacies but also that of the Roumanian pharmaceutical industry has duly increased. The scientific data obtained in this study will be evaluated in improving the quality of teaching the technique of pharmaceutical work. As far as pharmacies are concerned the ascertained character of the development of compounding and dispensing activity will be helpful in solving many problems, *e.g.* organization of the work space in a pharmacy, finding the apparatus and other equipment most necessary for pharmacies, calculating the work norm for a pharmacist, ascertaining of the suitable number of different members of the personnel, etc.

HUBERT ZACEK

CURRENT LITERATURE

. . . also calling your attention to the following articles appearing in recent hospital and pharmaceutical journals

. . . . . .

ADMINISTRATION

—Dispensing

Schradie, J. and Miller, O. H.: A Simple Approach to the Filling of Ophthalmic Prescriptions, *J. Am. Pharm. Assoc., Pract. Pharm. Ed.* 20:197 (Apr.) 1959.

—Supervision

Sperandio, G. J.: The Supervision of Medication Areas Outside the Pharmacy, *Tile and Till* 45:29 (Mar.-Apr.) 1959.

—Ward Stocks

Allen, F. A. D: Should Ward Stocks be Limited, *Public Pharmacist* (Great Britain) 16:118 (Apr.) 1959.

EQUIPMENT

Fowler, P. J.: Cleaning of Glassware and Rubber Closures, *Public Pharmacist* (Great Britain) 16:97 (Apr.) 1959.

Bradley, T. J.; Morton, I. K., and Frame, E. A.: Ultrasonics in the Syringe Service, *Public Pharmacist* (Great Britain) 16:110 (Apr.) 1959.

LAWS AND REGULATIONS

Vance, Joe: Special Pharmacy Permits Issued Alabama Hospitals, *South. Hosp.* 27:64 (Apr.) 1959.

GENERAL

Francke, Gloria N.: Annual Administrative Reviews—Pharmacy, *Hospitals, J.A.H.A.* 33:109 (Apr. 16) 1959.

SURVEYS

Sperandio, G. J.: The Audit of Pharmaceutical Service in Hospitals, *Tile and Till* 45:28 (Mar.-Apr.) 1959.

DRUG EVALUATIONS

by the Council on Drugs of the American Medical Association

► THE FOLLOWING MONOGRAPHS and supplemental statements on drugs have been authorized by the Council on Drugs of the American Medical Association for publication and inclusion in *New and Nonofficial Drugs*. They are based upon the evaluation of available scientific data and reports of investigations. In order to make the material even more valuable, dosage forms and preparations of individual drugs have been added to the monographs. These dosage forms and preparations were not taken from material published in the *Journal of the American Medical Association* by the Council on Drugs; rather, they were obtained from such manufacturers' brochures, news releases, etc., which were available to us at the time of publication. An attempt has been made to make the list of dosage forms as complete as possible. However, no guarantee can be made that the list of preparations is complete and it is suggested that hospital pharmacists consult manufacturers' releases for additional dosage forms and preparations.

The issues of the *Journal of the American Medical Association* from which each monograph has been taken is noted under each monograph. Monographs in this issue of the JOURNAL include those published in the *Journal* February 28 and March 14, 1959.

Notice

New and Nonofficial Drugs 1959 is now available from your local bookstore and from the publishers, J. B. Lippincott Company, Philadelphia, Pa. This 1959 edition contains monographs of drugs evaluated by the Council on Drugs of the American Medical Association and published in the Journal of the A.M.A. to January 1, 1959. The index listed below contains those drugs evaluated and published between December 20, 1958 and March 14, 1959.

Index

TO DRUGS EVALUATED IN THIS ISSUE

Index

TO EVALUATED DRUGS AND ARTICLES IN THE FEBRUARY, MARCH AND APRIL 1959 ISSUES OF THE AMERICAN JOURNAL OF HOSPITAL PHARMACY

Descriptions of New and Nonofficial Drugs

► IN ORDER TO further reemphasize that description of drugs published by the Council do not, in any case, imply approval, endorsement, or acceptance, the Council has voted to restate this fact in the introduction to all future monographs and supplemental statements which are published in THE JOURNAL for inclusion in its annual publication, New and Nonofficial Drugs. Although this fact was announced at the time the Council's seal-acceptance procedure was replaced in 1955 by the current evaluation program and has been clearly stated in all subsequent editions of the Council's annual publication, physicians generally should be aware that each drug description is designed to provide fair comment and criticism based on available evidence, whether or not this is considered adequate to establish usefulness. Physicians are urged to read each description to gain a proper appreciation of the Council's views concerning the actions, uses, hazards, and dosage of individual drugs.

More Prominent Listing of Trade Names

In order to make descriptions of drugs more easily identified by physicians who may be familiar with only their commercial names, the Council has voted to place

these names in parentheses immediately after the nonproprietary titles of all subsequently published monographs (and in supplemental statements on previously evaluated drugs), instead of at the end or in the text of such descriptions. This change in format is being implemented simultaneously in THE JOURNAL and for the 1960 edition of New and Nonofficial Drugs.

Identification of Commercial Sources

The Council also has authorized the identification of commercial sources of described drugs, of which it has knowledge or is informed, in the index for the 1960 and future annual editions of New and Nonofficial Drugs. The Council voted to indicate such sources parenthetically after all applicable commercial names (proprietary or nonproprietary) as they appear in the general index rather than in conjunction with monographs and to provide a separate alphabetic appendix of the complete organizational names and addresses of such sources as a further supplement to this information.

J.A.M.A. 169:114/946 (Feb. 28) 1959.

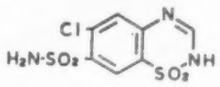
NEW AND NONOFFICIAL DRUGS

The following descriptions of drugs are based upon available evidence and do not in any case imply endorsement by the Council.

H. D. KAUTZ, M.D., *Secretary.*

Chlorothiazide — Diuril®

CHLOROTHIAZIDE (Diuril) is 6-chloro-7-sulfamyl-1,2,4-benzothiadiazine-1,1-dioxide.—The structural formula of chlorothiazide may be represented as follows:



Actions and Uses

Chlorothiazide, introduced commerically in 1958, is a potent, orally effective, nonmercurial diuretic agent. The drug is a potent inhibitor of the renal tubular reabsorption of sodium. In appropriate doses, it causes only a slight increase in excretion of bicarbonate and a considerable increase in the excretion of chloride. Potassium excretion is also increased but to a lesser extent than that of sodium or chloride. Under ordinary conditions of use, chlorothiazide does not alter urinary pH, nor does it cause significant changes in systemic acid-base balance. Its diuretic potency is greater than that of any other orally given nonmercurial diuretic presently available; it is only slightly less effective than parenterally administered mercurials. The mode of action of chlorothiazide in influencing the excretion of sodium and chloride has not been fully defined. Bicarbonate excretion is possible in the lower dose range because of a mild carbonic anhydrase inhibitory effect, but this effect is not responsible for the major excretion of sodium and chloride.

Chlorothiazide is rapidly and uniformly absorbed from the gastrointestinal tract. Its onset of action is rapid; diuretic effects are apparent within 2 hours after oral administration and persist for about 6 to 12 hours. Refractoriness to the drug is relatively uncommon even after prolonged periods of continuous administration.

Chlorothiazide is valuable as an adjunct in the management of congestive heart failure. The drug may be used for the initiation of diuresis as well as for the maintenance of the edema-free state in all types and degrees of severity of cardiac decompensation in which diuresis is required. As with any diuretic, patients with the most severe forms of the disease may be unresponsive to its action, particularly when the glomerular filtration rate is markedly reduced. Chlorothiazide is a satisfactory replacement for other orally given diuretics and can often be used in place of the parenterally administered organic mercurials. Its continued effectiveness makes it useful in many patients either who fail to respond or who have become refractory to other diuretics. Whereas therapy with chlorothiazide is not intended as a replacement for low-salt diets, administration of the drug makes it desirable to liberalize the salt intake in certain patients with congestive heart failure.

Chlorothiazide has been used with good results in the management of edema associated with nephrosis and certain types of nephritis. The drug may be of particular benefit to patients with nephrotic edema to whom corticotropin, glucocorticoids, and other agents which cause sodium retention are being administered concomitantly. If diuretic therapy is indicated in patients with edema caused by renal disease, chlorothiazide has an advantage over acetazolamide or ethoxzolamide in that it is most unlikely to precipitate a metabolic acidosis.

Chlorothiazide has been of value for the management of edema associated with liver disease, particularly portal cirrhosis. The drug has also been used for the treatment of toxemia and edema of pregnancy, for obesity or for premenstrual discomfort associated with fluid retention, and for the edema induced by such agents as corticotropin, adrenal cortical steroids, and certain estrogens.

In addition to its employment as a diuretic, chlorothiazide also is useful as an adjunct in the management of hypertension. When given alone, the drug generally has negligible or minimal lowering effects on the blood pressure. However, it is apparently capable of enhancing the effects of other antihypertensive agents such as Rauwolfia and Veratrum alkaloids, hydralazine, and the ganglionic blocking agents. It may also enhance the hypotensive effects of surgical sympathectomy. The mechanism of action of chlorothiazide in reducing high blood pressure has not been determined. The judicious use of chlorothiazide may make possible a sustained antihypertensive effect while allowing somewhat less rigid restrictions on dietary salt intake. When chlorothiazide is given in combination with other antihypertensive drugs, the dosage of the latter agents (particularly the ganglionic blocking agents and hydralazine) must be reduced markedly; this decreases or even eliminates certain of the more troublesome side-effects, including those resulting from parasympathetic ganglionic blockade.

Chlorothiazide is apparently well tolerated, and few serious immediate side-effects have been reported to date. It should be borne in mind, however, that the drug is an extremely potent compound in its influence on fluid and electrolyte excretion. It should not be given unless the patient can be regularly and carefully observed for the early signs of fluid and electrolyte imbalance and unless appropriate measures can be taken to prevent such imbalance or to correct it if it occurs.

In some patients, chlorothiazide may produce a hypochloremic alkalosis as the result of excessive excretion of chloride in relation to sodium and a concomitant rise in plasma bicarbonate levels. In these cases, the excretion of potassium is also likely to be excessive so that a hypokalemia is superimposed on the hypochloremic alkalosis. These electrolyte imbalances are more likely to occur during excessive or continued administration of the drug to patients who either fail to show a natriuretic response or, having shown an initial response, do not continue this response. Hypokalemia may result in increased sensitivity to the action of digitalis. Caution must therefore be employed to prevent hypokalemia when digitalis is administered. Changes in the dosage requirements for both digitalis and chlorothiazide must be anticipated. Patients with myocardial ischemia

as a result of coronary artery disease may also have a predisposition to serious cardiac arrhythmias if hypokalemia occurs. Hypochloremic alkalosis may be treated by making up the chloride deficiency (ammonium chloride should not be given to patients with hepatic disease). Hypokalemia should be corrected by giving potassium chloride. Both electrolyte disturbances can usually be reversed by the temporary discontinuance of chlorothiazide.

Occasionally the so-called low-salt syndrome may complicate therapy with chlorothiazide in patients with severe congestive heart failure who are markedly edematous. This complication is most likely to occur when excessive amounts of the drug are administered at the same time that dietary salt intake is rigidly restricted. In some cases, it may be necessary to treat this condition with the cautious infusion of hypertonic sodium chloride solutions along with rigid restriction in water intake, even in the presence of intense thirst.

In patients with severe renal or hepatic impairment, as indicated by clinical and laboratory observations, diuretic therapy may be ineffective and even contraindicated.

In patients with advanced cirrhosis, chlorothiazide should be administered cautiously; it may be necessary in some instances to discontinue administration. It should be borne in mind that in certain patients with hepatic disease, particularly those who have a history of a previous episode of hepatic coma or precoma, electrolyte imbalance (among other factors) may precipitate hepatic coma. When chlorothiazide is used in patients with cirrhosis, it may be desirable to place them on a low-protein diet and to administer potassium glutamate by mouth, as well as a broad-spectrum, nonabsorbable antibiotic such as neomycin, to minimize the possibility of coma.

Rare side-reactions to chlorothiazide include nausea, epigastric discomfort, dizziness, weakness, and paresthesias. In occasional instances, a drug rash has been observed. The possibility of allergic reactions arising from sensitivity to the drug should be borne in mind.

Dosage

Chlorothiazide is administered orally. Dosage must be highly individualized according to the response of the individual patient and the severity of the condition being treated. For diuretic effects, the usual dose for adults ranges from 500 mg. to 1 Gm. once or twice a day. A total daily dose of 1 Gm. or more is usually given in two divided doses. For antihypertensive effects in conjunction with the use of other antihypertensive drugs, the dosage of chlorothiazide ranges from as little as 250 mg. twice daily to 500 mg. three times a day.

Preparations: tablets 250 mg. and 500 mg.
Merck Sharp & Dohme, Division of Merck & Co., Inc., cooperated by furnishing scientific data to aid in the evaluation of chlorothiazide.

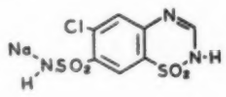
J.A.M.A. *169*:137/1191 (Mar. 14) 1959.

Preparations

Tablets Chlorothiazide (Diuril) 0.25 Gm. and 0.5 Gm.

Chlorothiazide Sodium — Diuril® Sodium

CHLOROTHIAZIDE SODIUM (Lyovac Diuril) is the sodium salt of 6-chloro-7-sulfamyl-1,2,4-benzothiadiazine-1,1-dioxide. —The structural formula of chlorothiazide sodium may be represented as follows:



Actions and Uses

The sodium salt of chlorothiazide, introduced commercially in 1958, has the same actions and uses as the parent substance except that it is more soluble and therefore suitable for parenteral injection. (See the monograph on chlorothiazide.)

Dosage

Chlorothiazide sodium is administered intravenously. The lyophilized powder is reconstituted with a suitable volume of sterile diluent immediately prior to administration. The drug may be given as a concentrated solution by direct intravenous injection or may be infused slowly by intravenous drip. Dosage is the same as for chlorothiazide.

Preparations: powder (injection) 500 mg.
Merck Sharp & Dohme, Division of Merck & Co., Inc., cooperated by furnishing scientific data to aid in the evaluation of chlorothiazide sodium.

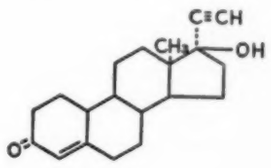
J.A.M.A. *169*:138/1192 (Mar. 14) 1959.

Preparations

Injection Chlorothiazide (Diuril) Sodium 0.5 Gm., lyophilized.

Norethandrolone — Nilevar®

NORETHANDROLONE (Nilevar) is 17α-ethyl-17-hydroxy-19-nor-4-androsten-3-one.—The structural formula of norethandrolone may be represented as follows:



Actions and Uses

Norethandrolone, introduced commercially in 1956, is a synthetic steroid hormone, which is related chemically and pharmacologically to testosterone. The drug exhibits androgenic properties, which are not as pronounced as with testosterone and its esters. Hence, norethandrolone is not used as an androgen. It does, however, exert a significant anabolic effect, which forms the basis for its clinical use. In laboratory experiments and short-term clinical studies, promotion of protein anabolism as evidenced by a reversal of a negative nitrogen balance has been demonstrated; the anabolic potency of the drug is approximately equal to that of testosterone and its esters. Accordingly, norethandrolone has been employed clinically in situations in which problems of protein catabolism are encountered. These include such conditions or circumstances as preparation for and recovery from surgery, recovery from severe illness, recovery from burns and severe trauma, nutritional care in wasting diseases such as carcinomatosis and tuberculosis, domiciliary care of decubitus ulcer in the chronically ill, and care of malnourished children and premature infants. Although the foregoing uses of the drug might logically follow because of its anabolic effect, they are at present considered theoretical. As yet, there is no evidence that a positive nitrogen balance can be maintained for prolonged periods of time, nor is there any direct evidence that, if this were so, such a therapeutic regimen would shorten convalescence, diminish surgical morbidity, or provide any additional benefits which could not be achieved by an adequate diet alone. Thus, although it can be considered logical to employ norethandrolone for the treatment of conditions characterized by a wasting of body protein, further critical research is necessary to substantiate its ultimate utility for this prpose.

In addition to the property of reversal of negative nitrogen

balance already described, under certain circumstances, the drug also effects a decreased loss of calcium; this property suggests its employment in certain conditions in which a greater degree of calcium retention is desirable. To the present time there is no evidence that norethandrolone increases bone age or speeds the closure of epiphyses in prepuberal children.

Norethandrolone, although less androgenic than testosterone and its esters, is capable of producing virilizing effects, especially after large doses or prolonged periods of use. For this reason it is contraindicated in patients with prostatic carcinoma. It may also exert progestational activity, causing endometrial proliferation and withdrawal bleeding in adult women. This reaction is more prone to occur if dosage is high or if therapy is terminated abruptly. Nausea and vomiting, which are seldom severe enough to require discontinuance of therapy, have been reported occasionally. Fluid retention and edema can also occur. The drug should therefore be administered cautiously to patients with demonstrable or incipient circulatory or renal failure and should be discontinued at the first sign of fluid retention. It should not be employed in nephrosis or the nephrotic stage of nephritis since it may effect an increased lipemia in such patients. Because norethandrolone alters electrolyte balance, it should not be administered to patients with severe burns or trauma during the acute phase of these conditions.

Norethandrolone may alter liver physiology, probably in a manner similar to methyltestosterone, and a few instances of jaundice have been reported. This manifestation is reversible and may not be evidence of true liver toxicity, although it is an indication for prompt discontinuance of the drug. The alteration of liver physiology may result in abnormal values in serum bilirubin, in serum transaminase, and in sulfobromophthalein determinations. However, in the absence of underlying liver disease, other liver function tests are normal. Continuous administration of norethandrolone for periods longer than three months is considered inadvisable, although a second such course may be initiated after a rest period of one month.

Dosage

Norethandrolone is administered orally or intramuscularly. Although dosage is highly variable, the average daily dose for adults usually ranges from 30 to 50 mg. Amounts as high as 100 mg. per day have been administered, but at this dosage level definite androgenic effects are likely to be encountered. For children, 0.5 mg. per kilogram of body weight is the usual daily oral dose.

Preparations: solution (injection) 25 mg. in 1 cc.; solution (oral) 8.3 mg. per cc.; tablets 10 mg.

G. D. Searle & Co. cooperated by furnishing scientific data to aid in the evaluation of norethandrolone.

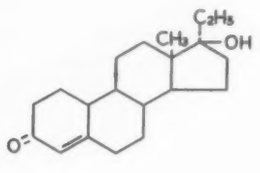
J.A.M.A. 169:115/947 (Feb. 28) 1959.

Preparations

Tablets Norethandrolone (Nilevar) 10 mg.

Norethindrone — Norlutin®

Norethindrone (Norlutin) is 17α-ethinyl-19-nortestosterone.—The structural formula of norethindrone may be represented as follows:



Actions and Uses

Norethindrone, sometimes referred to as norethisterone, is a highly potent, orally active, progestational agent which was introduced commercially in 1957. It produces the typical physiological and anatomic effects of progesterone and its derivatives, i. e., induction of a secretory endometrium, luteal changes in the vaginal epithelium, disappearance of cervical fern, increases in basal body temperature, and withdrawal bleeding from an estrogen-primed endometrium. When given from the 5th to the 25th day of the menstrual cycle, the drug is believed to inhibit ovulation. Continuous administration of norethindrone can also delay menstruation for prolonged periods, with only occasional instances of breakthrough bleeding. The pseudopregnancy thus induced is presumably an anovulatory amenorrhea. In terms of weight of drug required for progestational effects, norethindrone is one of the most potent agents known. Its onset and duration of action are about the same as with parenterally administered progesterone; if given for five days to amenorrheic women after estrogenic stimulation, the drug will generally induce withdrawal bleeding within 24 to 72 hours after its discontinuance. Animal experiments indicate that norethindrone has slight estrogenic effects; there is no evidence of androgenic activity. However, studies in animals are not adequate to estimate the extent to which observed histological changes may be due to the estrogenic activity of the drug. The drug is apparently not metabolized in the same manner as progesterone, since its administration does not cause an increase in the urinary excretion of 17-ketosteroids.

Norethindrone has been used in the treatment of primary and secondary amenorrhea. The drug will not induce secretory changes in the endometrium, with subsequent menstruation, unless there has been adequate estrogenic stimulation. Hence, in patients with inadequate endogenous estrogen production, as determined by vaginal cytology, estrogen priming is necessary. In women with menstrual irregularity or secondary amenorrhea due to inadequate corpus luteum activity, the monthly employment of norethindrone may help in reestablishing a normal cyclic pattern. This effect may be helpful in the management of patients with infertility problems, since it permits a more accurate prediction of the time of ovulation. Although the ultimate value of progestogens in the treatment of female infertility remains to be determined, agents such as norethindrone might theoretically be of value in establishing conditions conducive to pregnancy by reason of their inhibiting effect on the arborization of cervical mucus (which may act as a barrier to sperm penetration) and by preparing the endometrium for implantation of the ovum. Like other progestogens, norethindrone may be tried in the treatment of functional uterine bleeding, provided that genital malignancy has been ruled out and that curettage has established the diagnosis of benign endometrial hyperplasia.

Because it can induce a state of amenorrhea for as long as its daily administration is continued, norethindrone has been suggested as a means of temporary delay of the menstrual period for honeymoon, vacation, and athletic events. However, the use of a potent hormone to inhibit a normal physiological function, simply for patient convenience, should be discouraged. The menstrual-inhibiting property of the drug may, however, serve a useful purpose in alleviating the symptoms of endometriosis and causing a regression of endometrial implants.

Norethindrone, as well as other progestogens, has been tried in a more or less empirical manner for the treatment of threatened or habitual abortion. At present, there is a dearth of convincing evidence that any agent of this type can reduce the incidence of fetal loss. There is likewise insufficient evidence at hand to establish the proposed use of norethindrone for the treatment of premenstrual tension or dysmenorrhea.

The clinical use of norethindrone has not been associated with any appreciable toxicity. In occasional instances,

mild nausea, lethargy, and spotting before the calculated onset or after termination of menstruation have been reported. In young animals, prolonged administration of large doses of the drug causes a decrease in food consumption, with a consequent depression in weight gain; however, anorexia and weight loss have not been a problem clinically. Prolonged therapy with norethindrone generally decreases libido, an effect that would negate its proposed use to delay menstruation during the honeymoon.

Dosage

Norethindrone is administered orally. For amenorrhea, menstrual irregularity, functional uterine bleeding, and infertility, the usual dose is 10 to 20 mg. daily from the 5th to the 23rd day of the menstrual cycle. A five-day period is allowed for withdrawal bleeding to occur. Continuous daily doses of 20 to 30 mg. are usually sufficient to prevent menstruation. For the treatment of premenstrual tension and dysmenorrhea, the proposed dose is 10 mg. once or twice daily, beginning in the preovulatory phase and continuing to the 20th to the 23rd day of the cycle. Pending more evidence to show a beneficial effect, the proposed dosage for these latter purposes is considered experimental.

Preparations: tablets 5 mg.

Parke, Davis & Company cooperated by furnishing scientific data to aid in the evaluation of norethindrone.

J.A.M.A. **169:139/1193 (Mar. 14) 1959.**

Preparations

Tablets Norethindrone (Norlutin) 5 mg.

Phenylbutazone (Butazolidin) — Use of in Acute Superficial Thrombophlebitis

The Council has evaluated the clinical use of phenylbutazone for the treatment of acute superficial thrombophlebitis. Although only a few of the available reports of investigations have been well controlled, it is the clinical impression of most observers that the drug exerts beneficial effects in some, but not all, cases. The drug apparently relieves local pain, an action dependent upon its specific anti-inflammatory activity and distinct from the antipyretic or central analgesic properties of the compound. It should be emphasized that phenylbutazone is not intended for thrombophlebitis of the deep veins but should be considered only for selected patients with the acute superficial form of the disease. The Council concluded that further controlled observations are needed to determine its ultimate value in the therapy of this condition as compared with other methods of treatment.

Since the treatment of acute superficial thrombophlebitis involves medication over relatively short periods of time, the danger of drug-induced hematopoietic depression or fluid and electrolyte retention is appreciably reduced. Nevertheless, phenylbutazone should be used cautiously, keeping in mind its known ability to produce serious untoward reactions. Treatment should be discontinued immediately upon the appearance of any toxic effect. (See the monograph on phenylbutazone in New and Nonofficial Drugs.)

In acute superficial thrombophlebitis, which fails to respond to the usual conservative measures, phenylbutazone, 600 mg. per day, may be tried in divided doses for two or three days. If no beneficial results are apparent within 72 hours, the drug should be discontinued. When indicated, 300 mg. per day may be given thereafter for an additional 5 to 7 days, but in no case should therapy be continued longer than 10 days.

The Council voted to amend New and Nonofficial Drugs to describe this additional use of phenylbutazone.

Geigy Pharmaceuticals, Division of Geigy Chemical Corporation, cooperated by furnishing scientific data to aid in the evaluation of the use of phenylbutazone in acute superficial thrombophlebitis.

J.A.M.A. **169:116/948 (Feb. 28) 1959.**

Poloxalkol — Polykol®

POLOXALKOL (Polykol) is an oxyalkylene polymer with the following structure:

$$HO(C_2H_4O)^a(C_3H_6O)^b(C_2H_4O)^cH$$

Actions and Uses

Poloxalkol, introduced commercially in 1958, is a relatively tasteless, nonionic, surface-active agent with actions and uses similar to those of dioctyl sodium sulfosuccinate. After oral administration, the drug lowers surface tension of water and intestinal fluids, thus tending to soften the stool and facilitate elimination. The wetting action of poloxalkol makes it potentially useful for the treatment and prevention of constipation associated with dry, hard stools. Clinical trials, thus far chiefly limited to infants and children, would indicate that the drug is often, but not always, effective in relieving chronic constipation. The action of the drug is neither rapid nor drastic; thus, several days may elapse before a therapeutic effect is apparent. Poloxalkol per se is pharmacologically inert; its fecal moistening effects are due entirely to the detergent-like physical properties of the compound. Although the drug appears to be essentially non-toxic, the possibility that it may increase the absorption of mineral oil or of fat soluble substances in harmful amounts should be borne in mind.

Dosage

Poloxalkol is administered orally. For infants and children under three years of age, the usual dose ranges from 100 to 200 mg. once or twice daily. For children 3 to 12 years of age, the dose is 200 mg. once to three times daily.

Preparations: solution (oral) 200 mg. per cc.

The Upjohn Company cooperated by furnishing scientific data to aid in the evaluation of poloxalkol.

J.A.M.A. **169:116/948 (Feb. 28) 1959.**

Preparations

Solution Poloxalkol (Polykol) 200 mg. per ml.; 30 ml. dropper bottles.

POSITIONS

in hospital pharmacy

PERSONNEL PLACEMENT SERVICE

The Personnel Placement Service is operated without charge for the benefit of hospitals and pharmacist members of the American Pharmaceutical Association and the AMERICAN SOCIETY OF HOSPITAL PHARMACISTS. The ultimate purpose is the improvement of pharmaceutical services in hospitals, by more adequately fulfilling hospital pharmacy personnel needs and by locating positions which provide challenging opportunities for pharmacists who have indicated an interest in a hospital career.

By participating in the service, the hospital indicates a desire to achieve a pharmaceutical service which meets the *Minimum Standard for Pharmacies in Hospitals.* A description of the position should be submitted to the Division of Hospital Pharmacy on the forms provided. The hospital will receive applications directly from the applicant. The hospital agrees to reply to each application received and to notify the Division of Hospital Pharmacy when the position is filled.

The pharmacist, by participating, agrees to submit a Personnel Placement Service Information Form to the Division of Hospital Pharmacy. The applicant will then be notified of openings listed with the Service as they become available and can negotiate directly with the hospital if he is interested. It is agreed that the Division of Hospital Pharmacy will be notified as soon as a position is accepted.

A listing of positions open and wanted will be made regularly in the AMERICAN JOURNAL OF HOSPITAL PHARMACY without charge. Neither the name of the hospital offering the position nor the name of the applicant will be listed, except by code. All inquiries should be directed as shown below, including the code number.

Address all inquiries to

Division of Hospital Pharmacy
2215 Constitution Avenue, N. W.
Washington, 7, D. C.

positions open

CHIEF PHARMACIST—350 bed hospital. Must be eligible for licensure in N.J.; interest in manufacturing; 44-hour week, 2 weeks' vacation. Salary $5200-$5700. PO-6

STAFF PHARMACIST—550 bed general hospital located in Ohio. 40-hour week; 2 weeks' vacation. Salary $400-$450. PO-34

ASST. CHIEF PHARMACIST—310 bed general hospital located in Va. 40-hour week, 2 weeks' vacation, 3 weeks' sick leave, 6 holidays. Salary $5,000 to $6,000. Also
STAFF PHARMACIST—259 bed hospital located in Va. Hospital experience preferred. 40-hour week, 2 weeks' vacation. Salary open. PO-35

STAFF PHARMACIST—460 bed general hospital in Mass. 40 hour week, 2 weeks' vacation; other benefits. PO-40

ASST. CHIEF PHARMACIST—Large voluntary hospital located in Brooklyn; N.Y. registration required. Supervisory ability needed. 35-hour week, 2 weeks' vacation, 10 days' sick leave, 9 holidays. PO-51

CHIEF PHARMACIST—88 bed hospital located in Pa. Planning expansion to 125 beds for general patients and 40 beds for chronic patients. Possibility for pharmacist to serve as Asst. Administrator in charge of Purchasing, Central Supply and Store Room. 40 hour week; 2-4 weeks' vacation. Young man preferred. Salary open. PO-59

STAFF PHARMACIST—325 bed research hospital. Min. 2 years' experience preferably in hospital pharmacy. N.Y. registration required. Manufacturing sterile solutions and assisting in product development. Salary $4770-$5860 plus benefits. Research work beyond 40-hour week available at $3.00 per hour. PO-61

ASST. CHIEF PHARMACIST—100 bed general hospital. Ind. registration required. Young lady preferred. Hospital experience not necessary. Main area of responsibility in Central Supply and Solution Manufacturing. 40 hour week, 3 weeks' vacation. PO-63

CHIEF PHARMACIST—325 bed general hospital. Eligible for registration N.Y. Hospital experience desirable but not necessary. 40-hour week, 2 weeks' vacation. Salary dependent upon qualifications. PO-70

ASST. CHIEF PHARMACIST—313 bed general hospital. Eligible Ky. registration. Previous hospital experience not necessary. 40-hour week, 2 weeks' vacation. Salary $400-$500, benefits. PO-73

CHIEF PHARMACIST—265 bed general hospital. Varied duties including teaching if interested. No experience required. 40-hour week, 2 weeks' vacation. Salary $400 (approx.) plus benefits. PO-74

STAFF PHARMACIST—335 bed hospital located in Fla. Duties include responsibilities in outpatient department and parenteral solution room. 40-44 hour week, 2 weeks' vacation; 1 meal daily. Salary $5200. PO-75

ASST. CHIEF PHARMACIST—237 bed general hospital in West Va. Female desired. 44-hour week; 2 weeks' vacation. PO-77

CHIEF PHARMACIST—320 bed general hospital located in Iowa. Experience or internship in hospital pharmacy required. 40-44 hour week, 2 weeks' vacation, other benefits. Salary open. PO-80

STAFF PHARMACIST—316 bed general hospital. Eligible registration in Minnesota. Some manufacturing; 40-hour week, 2 weeks' vacation; other benefits. Salary open. PO-81

STAFF PHARMACIST—295 bed hospital expanding to 500 in future. Eligible for registration in Mich. Experience in hospital pharmacy and manufacturing preferred. 40-hour week, 2 weeks' vacation. Salary $5720. PO-86

CHIEF PHARMACIST—400 bed general hospital. B.S. required. Internship in hospital pharmacy preferred. Eligible for Tex. registration. 40-hour week, 2 weeks' vacation. Salary up to $6,500 to start. PO-90

ASST. CHIEF PHARMACIST—315 bed general hospital. Registration in Iowa required. Experience desirable but not essential. 40-hour week, 2 weeks' vacation. Salary $450. PO-92

STAFF PHARMACIST—500 bed general hospital located in Okla. B.S. required. 40-hour week, salary open. PO-95

STAFF PHARMACIST—400 bed general hospital. Eligible registration in Fla. 40-hour week, salary open. PO-96

CHIEF PHARMACIST—425 bed hospital. Male preferred. Mo. registration. Will train good applicant without experience. 40-hour week. Salary open. PO-98

STAFF PHARMACIST—400 bed general hospital located in Iowa. 40-hour week, 2 weeks' vacation. Salary open. PO-99

ASST. CHIEF PHARMACIST—152 bed general hospital expanding to 180 beds. Registration in Neb. required. 40-hour week, 2 weeks' vacation. Salary open. PO-101

CHIEF PHARMACIST—73 bed general hospital. Complete responsibility of Pharmacy Dept. 44-hour week, 2 weeks' vacation. Salary open. PO-102

STAFF PHARMACIST—215 bed general hospital expanding to 35 more beds. N. Y. registration required as well as hospital experience. 40 hour week, 2 weeks' vacation. Salary open. PO-104

CHIEF PHARMACIST—244 bed hospital. California registration required. Complete charge of pharmacy including all purchasing. 40-hour week, 2 weeks' vacation. Salary $505-$613. PO-106

STAFF PHARMACIST—585 bed general hospital located in Ore. One year hospital pharmacy experience required. Salary open. PO-107

STAFF PHARMACIST—320 bed general hospital. Must be eligible for State of Wash. license. Experience in hospital pharmacy desirable. 40-hour week, 2 weeks' vacation, other benefits. Salary $6300-$7380. PO-110

STAFF PHARMACISTS—Two—Eligible for licensure in West Va. and Ky. Salaries good. PO-111

CHIEF PHARMACIST—340 bed general hospital in south; affiliated with medical school; outpatient clinic; hospital pharmacy internship program. Salary $6,600-$7,000. PO-112

STAFF PHARMACST—300 bed, short term general hospital. Pharmacy encompasses Central Supply, Oxygen and Inhalation Therapy and Orthopedic equipment, etc. Plans to expand two additional floors with 150 more beds underway. Applicant must be eligible for registration in N.C. Benefits include 2 weeks' vacation, sick leave, group life term insurance, retirement program. 44-hour week. Salary $5100-$5950. PO-113

CHIEF PHARMACIST—150 bed general hospital; to assume complete responsibility for the pharmacy department. Salary $525 per month; 3 weeks' vacation; discount on meals and hospitalization. PO-114

ASST. CHIEF PHARMACIST—425 bed general hospital; duties include dispensing and supervision of special projects. Prefer male applicant with internship in hospital pharmacy. Unique opportunity to obtain experience. Salary $7,000 to $7,500 to start. PO-115

STAFF PHARMACIST—150 bed general hospital. Female, only considered. Must be eligible for Ill. registration, hospital experience desirable but not necessary. 40-hour week, 2 weeks' vacation. Salary open. PO-116

STAFF PHARMACIST—1,000 bed general hospital. Eligible registration in Ohio. Large O.P.D. Clinic. B.S. required. 40-hour week, 2 weeks' vacation. Salary $105 per week. PO-117

STAFF PHARMACIST—250 bed hospital. Ohio registration, but experience not necessary. 40-hour week, 2 weeks' vacation. Scheduled salary increases. Salary $450. PO-118

SENIOR PHARMACIST—325 - expanding to 500 — bed university hospital. Requirements: B.S., registration in Calif., hospital pharmacy internship, supervisory experience. 40-hour week, 3 weeks' vacation. Salary $7356 - $8520. PO-119

CHIEF PHARMACIST—748 bed hospital for long-term illness. Eligible Ohio registration. Must be able to assume responsibility for parenteral solution room and supervisory duties. Male desired. 40-hour week, 3 weeks' vacation. Salary $471-$550. PO-120

STAFF PHARMACIST—275 bed general hospital located in Michigan. Duties varied, interesting and challenging. Salary open. PO-121

CHIEF PHARMACIST—60 bed mission hospital operated by Presbyterian National Missions; extensive outpatient department; on Navajo Indian Reservation near Gallup, N. M. Qualified to register in Arzona; single man or woman, challenged by service rather than benefits. PO-122

ASST. CHIEF PHARMACIST—3300 bed psychiatric hospital. To assist in the reorganization of the department. Eligible for registration in Ohio. Two years experience preferred. PO-123

STAFF PHARMACIST—450 bed general hospital located in Ohio. Salary open. PO-124

STAFF PHARMACIST—1000 bed general hospital located in Tex. Applicants should be interested in manufacturer of pharmaceutical preparations, research and development of new products, sterile solution manufacture, etc. Some hospital experience desirable. Salary $490 per month and up; 40-hour week; 1 month vacation; free medical care and other benefits. PO-125

positions wanted

INDIAN PHARMACIST—Desires appointment to obtain higher training in hospital pharmacy; graduate Madras Univ.; 1½ years' experience in 1,000 bed hospital, including inpatient and outpatient dispensing, parenteral and general manufacturing and administration. PW-68

HAITIAN STAFF PHARMACIST—Male, married. Has 5 years' hospital experience. Present owner of pharmacy. Desires to locate in northwest U.S. PW-74

STAFF PHARMACIST—4 years' hospital pharmacy experience; prefers Wash. state (registered). Female married, B.S. pharmacy. PW-87

IRANIAN PHARMACIST—Desires opportunity to continue hospital pharmacy studies; single, age 30; excellent academic background; now studying industrial chemistry Columbia Univ. Prefers location in West or Northeast. PW-88

ASST. PHARMACIST—Female, married. Educated and trained in Philippines. Served hospital pharmacy internship. Registered Manila. Desires to locate East Coast of U.S. PW-91

CHIEF PHARMACIST—Prefers small hospital in Ohio. Male, married. B.S.; registered Ohio. Excellent academic and professional background. PW-93

STAFF PHARMACIST OR ASST. CHIEF—Female, single, Filipino, educated and trained Philippines. 10 years' hospital experience. Served hospital pharmacy internship. PW-95

PHARMACIST—Male, married. Registered Ill. Desires to locate in New England. PW-102

STAFF PHARMACIST—Single female, registered Mo. B.S.; hospital pharmacy experience. Desires locate Midwest. PW-104

CHIEF OR ASST. CHIEF PHARMACIST—Male, married, registered Mich. and Ariz. Served hospital pharmacy internship. Retail experience plus 7 years' hospital pharmacy experience. PW-113

STAFF PHARMACIST—Male, married, registered Mass. Retail and hospital pharmacy experience. Desires locate East or Northeast. PW-114

CHIEF OR STAFF PHARMACIST—Female, single, registered Tex. Desires to locate in East. PW-115

ASST. CHIEF PHARMACIST—Male, single. B.S. Vet. Adm. Hosp. experience. Registered Va. and Washington, D.C. PW-117

STAFF PHARMACIST—Male, married. B.S. registered La., Va., and Washington, D C. PW-118

ASST. DIRECTOR OR DIRECTOR OF PHARMACY SERVICES—Male, single, B.S. Retail and 4 years' hospital experience. Registered, Ill. PW-119

ADMINISTRATOR—Male, married, D.Sc. 15 years' hospital pharmacist. Desires locate Fla. PW-120

PHARMACIST—Male, single. B.S. Registered Maine. Served hospital pharmacy internship. PW-122

CHIEF PHARMACIST—Male, single. Registered Conn. and N. J. 10 years' hospital pharmacy experience, B.S. PW-123

CHIEF PHARMACIST—Female, single. B.S. 2 years' hospital experience. Registered Ohio. Prefers Ohio or Ill. PW-126

PHARMACIST—Female, Filipino, recent graduate Manila Central Univ. Would like to locate in western part of U. S. PW-127

PHARMACIST—Male, married. Registered Mass., D.C. and Md. Will locate any part of U. S. Served hospital pharmacy internship. Over 20 years hospital pharmacy experience. PW-128

STAFF PHARMACIST—Male, married. Several years hospital pharmacy experience. Registered Mich. PW-129

STAFF PHARMACIST—Female, married, registered Kansas. 4 years hospital pharmacy experience. PW-136

CHIEF PHARMACIST—Male, married, registered Ark. B.S. pharmacy. 5 years experience as Chief Pharmacist. PW-137

ASST. CHIEF PHARMACIST IN LARGE HOSPITAL OR CHIEF PHARMACIST IN SMALLER HOSPITAL—Available in June. B.S. Chemistry, B.S. Pharmacy, M.S. Hospital Pharmacy. Completing internship at Johns Hopkins Hospital. Single; completed military obligation. Will locate anywhere. PW-138

CHIEF PHARMACIST—Male, married. Registered Wis. Ph.D. Several years' hospital pharmacy experience. Locate any section of the country. PW-139

CHIEF PHARMACIST—Male, married. B.S. Conn. registration. 5 years' hospital pharmacy experience. Prefers Northeast section of country. PW-140

STAFF PHARMACIST—Male, single. Registered N.Y. and Me. B.S. Served Hospital Pharmacy Internship. PW-141

ASST. CHIEF PHARMACIST—Male, married. B.S. Pharmacy. Registered N.Y. Hospital and retail experience. Locate N.Y. state. PW-142

STAFF PHARMACIST—Female, single. Registered Philippines. M. S. Pharmacy, St. Louis Coll. of Pharm. Locate any section of country. PW-143

CHIEF PHARMACIST—Prefers N.Y or N.J. area. Over 20 years' experience as chief pharmacist and purchasing agent. Graduate St. John's Univ., Coll. of Pharm. and registered in N.Y. and N.J. PW-144

CHIEF PHARMACIST—Registered in N.J.; any location; 6 years' experience in hospital pharmacy. PW-145

STAFF PHARMACIST—Male, single. Completed military requirements. Hospital pharmacy experience. Prefers east. PW-146

CHIEF PHARMACIST—Registered in Mo. and Ill. Ph. G. degree; 8 years' experience in hospital pharmacy. PW-147

ASST. CHIEF OR CHIEF PHARMACIST—Single male. Registered in D.C., Ill., Md., and Pa. Graduate Univ. of Pittsburgh in 1953; experience in research; prefers north and east. PW-148

PHARMACIST—Male, single, B.S. pharmacy June, 1959. Locate east. PW-149

CHIEF PHARMACIST—Male, married. B.S. 10 years' hospital pharmacy experience. Registered Mass., Ill., Mo., Ky., Tenn., and Va. PW-150

ASST. PHARMACIST—Male, married. B.S. Served hospital pharmacy internship. Experienced hospital research and retail pharmacy. PW-151

STAFF PHARMACIST—Male, married. B.S. Served hospital pharmacy internship. Registered D.C. PW-152

HOSPITAL PHARMACY INTERN—Will graduate from S.D. State College of Pharmacy in June; married, 2 children; age 25; interested in a career in hospital pharmacy. Prefers to locate in west. PW-153

ASST. CHIEF PHARMACIST—Male, single. Registered N.Y., Vt. Served hospital pharmacy internship; now employed part-time staff pharmacist. Prefers eastern part of country. Has M.S. 4 years' hospital pharmacy experience. PW-154

CHIEF PHARMACIST—Male, single. Registered West Va. Hospital pharmacy experience. PW-155

CHIEF PHARMACIST—Female, single. B.S. Registered R. I., 8 years hospital pharmacy experience. PW-156

STAFF PHARMACIST—Male, married. Registered N.Y., N.J. Prefers New England. PW-157

STAFF PHARMACIST—275 bed general hospital located in Michigan. Duties varied, interesting and challenging. Salary open. PO-121

CHIEF PHARMACIST—60 bed mission hospital operated by Presbyterian National Missions; extensive outpatient department; on Navajo Indian Reservation near Gallup, N. M. Qualified to register in Arizona; single man or woman, challenged by service rather than benefits. PO-122

ASST. CHIEF PHARMACIST—3300 bed psychiatric hospital. To assist in the reorganization of the department. Eligible for registration in Ohio. Two years experience preferred. PO-123

STAFF PHARMACIST—450 bed general hospital located in Ohio. Salary open. PO-124

STAFF PHARMACIST—1000 bed general hospital located in Tex. Applicants should be interested in manufacturer of pharmaceutical preparations, research and development of new products, sterile solution manufacture, etc. Some hospital experience desirable. Salary $490 per month and up; 40-hour week; 1 month vacation; free medical care and other benefits. PO-125

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